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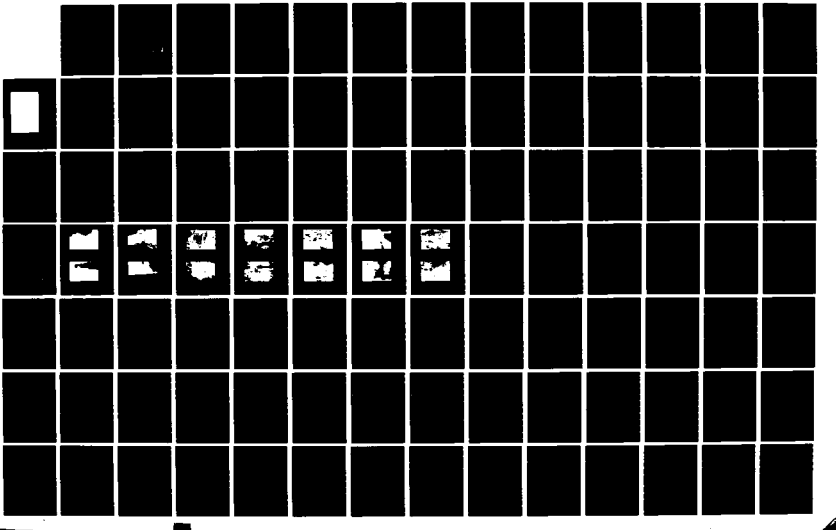
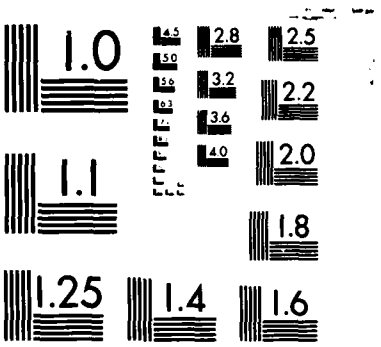
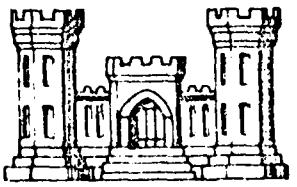




RICHELIEU RIVER BASIN
FAIRFAX

ST. ALBANS RESERVOIR DAM (SOUTH)
VT 00057

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM



DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

SEPTEMBER 1978

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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9. PERFORMING ORGANIZATION NAME AND ADDRESS		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
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Cover program reads: Phase I Inspection Report, National Dam Inspection Program; however, the official title of the program is: National Program for Inspection of Non-Federal Dams; use cover date for date of report.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

DAMS, INSPECTION, DAM SAFETY,

Richelieu River Basin
Fairfax VT.

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The dam is an earth fill dam about 1950 ft. long and 26 ft. high. It is small in size with a significant hazard potential. The ½ PMF will overtop the dam by 1.1 ft. The dam is judged to be in fair condition. There were various significant conditions observed. There are recommendations which should be undertaken by the owner.

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DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF
NEDED

MAY 14 1979

Honorable Richard A. Snelling
Governor of the State of Vermont
State Capitol
Montpelier, Vermont 05602

Dear Governor Snelling:

I am forwarding to you a copy of the St. Albans Reservoir Dam (South) Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Department of Water Resources, the cooperating agency for the State of Vermont. In addition, a copy of the report has also been furnished the owner, City of St. Albans, Department of Public Works, City Hall, St. Albans, Vermont 05478, ATTN: Mr. William Scott, Director.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you and the Department of Water Resources for your cooperation in carrying out this program.

Sincerely yours,

JOHN P. CHANDLER
Colonel, Corps of Engineers
Division Engineer

Incl
As stated

ST. ALBANS RESERVOIR DAM (SOUTH)

VT00057

FAIRFAX, VERMONT

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT

Identification No.: VT00057
Name of Dam: St. Albans Reservoir Dam (South)
Town: Fairfax
County and State: Franklin County, Vermont
Stream: Unknown
Date of Inspection: August 3, 1978

BRIEF ASSESSMENT

The St. Albans Reservoir Dam (South) is an earth fill dam, approximately 1950 feet long with a maximum height of about 26 feet. The impoundment serves as a drinking water supply for the City of St. Albans. Appurtenant to the dam is an intake and gate house, and a concrete spillway channel. Located immediately below the dam is a pumping station to pump water to the North Reservoir.

The dam is classified as "small". The impoundment is estimated to have a normal storage volume of 322 acre-feet and a surface area of 26 acres. The drainage area for the impoundment includes the drainage area for St. Albans Reservoir and is approximately 2.28 square miles.

The hazard classification is judged to be "significant" due to the location of the water pumping station and a highway bridge immediately below the dam. Based on the size and hazard classification in accordance with "Recommended Guidelines for Safety Inspection of Dams, Department of the Army, November 1976" the test flood is the 1/2 Probable Maximum Flood (PMF). The 1/2 PMF will overtop the dam by 1.1 feet.

The dam is judged to be in fair condition.

The following significant conditions were observed:

1. The concrete spillway has seriously deteriorated and is judged to be in poor condition.

2. The dam is overgrown with brush and some large trees.

3. There is evidence of erosion along the downstream slope at the right of the training wall.

4. There is evidence of wave cutting action on the upstream slope of the dam between the top of riprap and the dam crest.

5. The crest of the dam is uneven and has the potential of being overtopped by as much as 1.1 feet during the test flood of 1/2 PMF.

A detailed assessment and recommendations for remedial measures are contained in Section 7. In summary, it is recommended that the following investigations and designs be prepared by a qualified engineer and that a contractor be hired to make the necessary repairs within two years of the receipt of this report:

1. Inspect the downstream slope and toe of the dam when the reservoir is full to identify possible seeps or wet areas.

2. Provide design recommendations for the rehabilitation of the spillway structure.

3. Perform detailed hydraulic and hydrological studies to determine the significance of capacity of the spillway.

4. Place riprap along the top portion of the upstream slope.

5. Develop a maintenance program including removal of brush and trees from the dam, and routine periodic inspections.

DUFRESNE - HENRY ENGINEERING CORP. INCORPORATED 1961 SPRINGFIELD, VT.

STATE OF VERMONT WALTER A. HENRY, P.E. No. 530 PROFESSIONAL ENGINEER

Walter A Henry

This Phase I Inspection Report on St. Albans Reservoir Dam (South) has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.

Charles G. Tiersch

CHARLES G. TIERSCH, Chairman
Chief, Foundation and Materials Branch
Engineering Division

Fred J. Ravens Jr.

FRED J. RAVENS, Jr., Member
Chief, Design Branch
Engineering Division

Saul Cooper

SAUL COOPER, Member
Chief, Water Control Branch
Engineering Division

APPROVAL RECOMMENDED:

Joe B. Fryar

JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test Flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

TABLE OF CONTENTS

SECTION 6 - STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations

The visual observations did not disclose any obvious stability problems. However, the reservoir level at the time of the inspection was below the elevation of the downstream toe, except in the vicinity of the gatehouse, and therefore seepage related stability problems which may be present at full reservoir conditions could not be evaluated. Potential stability related problems that were observed are presented below:

1. The presence of large trees growing and existence of large stumps on the embankment will or may have already resulted in rotting roots which could provide possible paths for internal erosion.

2. The upstream slope from the top of the riprap to the dam crest, about 2 to 4 feet in height, is eroded to a near vertical slope at many locations probably as a result of wave action.

3. The location where small channels were observed at the toe of the upstream riprap could be a source of seepage when the reservoir is full.

4. The poor condition of the spillway channel and training walls can result in erosion of the dam if a large water flow causes removal of pavement sections and collapse of the training walls.

b. Construction and Design Data

There are no design or construction data available to formally evaluate the stability of this dam.

c. Operating Records

The available operating records do not contain evidence of instability of the dam.

SECTION 5: HYDRAULIC AND HYDROLOGIC EVALUATION

5.1 Evaluation of Features

a. Design Data

No design data for the dam or spillway was available.

b. Experience Data

There are no records of high flow conditions at the site.

c. Visual Observations

The dam crest is irregular. If overtopping were to occur, the low spots would be subjected to greater flow velocities and would increase the possibility of eroding a channel in the dam face.

d. Overtopping Potential

Preliminary computations of the overtopping potential indicate that during the test flood (1/2 PMF), the spillway would not be capable of passing the discharge. The dam will overtop when the water surface elevation is greater than 722 feet MSL. The test flood water surface elevation is 723.1 feet MSL, resulting in a maximum surcharge of 1.1 feet over the dam. The average surcharge for the test flood is 0.7 feet with approximately 845 feet of the dam being overtopped. Discharge for the test flood is 3060 cfs (1340 csm).

e. Dam-Break Flood

Analysis of the flood wave that would be generated by a dam burst was based on engineering judgment. Assuming a flood wave of two-thirds the height of the dam, a 17-foot high wave would be produced. Failure of the dam could result in the destruction of the pumping station directly downstream of the dam face. Bridge 17 on Town Highway No. 10, approximately 2000 feet below the dam would probably be washed out. Damage to homes would be insignificant as they are located above the potential wave height.

SECTION 4: OPERATIONAL PROCEDURES

4.1 Procedures

The South Reservoir is used to augment the water in the North Reservoir. During dry periods water is pumped from the South Reservoir into the North Reservoir. In addition, if the South Reservoir gets low, it is possible to divert water from nearby Silver Lake into the South Reservoir.

4.2 Maintenance of Dam

The only maintenance of the dam consists of mowing a roadway on the crest of the dam from Route 104 to the pumping station.

4.3 Maintenance of Operating Facilities

There is no maintenance of the operating facilities.

4.4 Description of Warning System in Effect

None exists for this dam.

4.5 Evaluation

The maintenance presently being performed is insufficient to insure the safety of the dam. Recommendations for a maintenance program are outlined in Section 7.

Additional appurtenant structures which appeared to be abandoned included a valve chamber at the downstream toe of the dam, and several valves inside manholes.

d. Reservoir Area

The reservoir area is 26 acres at normal pool level (elevation 717 feet MSL). The surface area was assumed to increase at a rate of 2.7 acres per foot of water surface elevation increase.

e. Downstream Channel

The downstream channel was in generally poor condition on the day of the inspection. The channel had accumulated a large amount of tree debris and was overgrown with brush.

3.2 Evaluation

Based on visual inspection, the dam is in fair condition. Potential future problems are the lack of riprap and erosion near the crest of the dam, the trees and shrubs growing on the dam, and the condition of the spillway channel and training walls, the trees and shrubs that overhang the channel, and the seepage potential which could not be assessed at the time of the inspection because the reservoir was empty.

The downstream slope is generally overgrown with shrubs and trees. Trees and tree stumps up to 18 inches in diameter exist along the toe of the slope. No erosion of the slope was observed except as noted below; however, numerous crater-like depressions several feet in diameter and a few feet in depth were observed at or near the toe of the slope. These craters may have been as a result of stumps removed and the area not backfilled.

A stone masonry manhole at the toe of the slope was located about 1150 feet south of the entrance gate. The manhole has dimensions of about 6 feet wide by 12 feet long and 6 feet deep. A corrugated steel pipe about 8 inches in diameter discharges into the manhole. Because the manhole was in very poor repair, it was not possible to determine if the manhole was part of a toe drainage system.

Except at the gatehouse, the reservoir level during inspection was below the elevation of the downstream toe. Thus detection of reservoir related seeps was not possible. Small holes, up to 2 inches in diameter, which may have been the result of seepage and/or animals, were observed along the toe.

c. Appurtenant Structures

The gatehouse structure has numerous cracks in the concrete. The gate chamber was not observed as the entrance was blocked up. The outlet channel was the natural bed of the stream.

The spillway is located at the south end of the dam about 50 feet from the left abutment. The right and left training walls are constructed of stone masonry and are in poor condition and show evidence of repair in the past. The collapse of some stones at the downstream end of the right wall has produced some erosion of the adjacent downstream slope of the dam. The spillway channel is lined with concrete for 95 feet. The concrete is in very poor condition with two holes several feet in diameter and eroded down to the bedrock foundation. Below the concrete zone, the spillway channel is in bedrock. Numerous trees greater than 6 inches in diameter have fallen into and obstructed the channel. In addition, trees up to 18 inches in diameter overhang the channel and could possibly obstruct the spillway flow should they fall into the channel.

SECTION 3: VISUAL INSPECTION

3.1 Findings

a. General

The dam was judged to be in fair condition. The concrete spillway has seriously deteriorated. The dam is overgrown with brush. There is some evidence of erosion on the downstream slope and erosion on the upstream slope.

b. Dam

Sketches of the dam including a profile and cross sections are contained in Appendix B. The crest of the dam is uneven with elevations ranging from 722 to 725.

During inspection, the reservoir level had been drawn down such that practically the entire upstream slope was exposed. The upper 2 to 4 feet of the upstream slope are covered by grass and shrubs and show significant bank erosion, as evident by a near vertical slope. Burrowing animal holes near the top of the slope were also observed. The rest of the slope down the toe is covered with riprap consisting of stone, ranging in size from a few inches to about 2 feet but generally from one to two feet. The riprap appears, in general, in good condition.

Channels were observed at the toe of the upstream slope about 1090 feet from the steel gate. The channels were dry, and it was not possible to determine whether they were caused by animals or by water flow.

The reservoir bottom from the gatehouse to the north end of the embankment was wet, and in some places flowing water was observed draining from the embankment. At one location the water was rusty in color.

The crest contains a grass-covered access way, about 8 feet wide, to the gatehouse. Shrubs and trees, several inches in diameter, exist on both the upstream and downstream edge of the crest. The crest of the dam from the gatehouse south to the emergency spillway does not have a regularly maintained access way, and as a result, numerous trees several feet high have overgrown this area.

SECTION 2: ENGINEERING DATA

2.1 Design

There is no design information available for this dam.

2.2 Construction

There is no information on the construction other than the date of construction - 1873.

2.3 Operation

In general, there is no operation involved with the dam.

2.4 Evaluation

a. Availability

The design and construction records for this dam are not available.

b. Adequacy

The lack of in-depth engineering data does not allow for a definitive review. Therefore, the adequacy of this dam, structurally and hydraulically, cannot be assessed from the standpoint of review of design calculations, but must be based primarily on the visual inspection, past performance history and sound hydrologic and hydraulic engineering judgment.

c. Validity

Not applicable.

(6) Zoning

None known

(7) Impervious Core

None known

(8) Cutoff

None known

(9) Grout Curtain

None known

i. Spillway

The spillway is a concrete chute spillway, approximately 91 feet in length and approximately 34 feet wide. The sidewalls of the chute taper from approximately 5 feet in height into ledge outcropping. The sidewalls are constructed of laid-up stone. The spillway crest is a triangular weir with a vertical upstream face, 34 wide, and located at elevation 719.8.

The end of the concrete flume elevated from 1 to 3 feet above ledge outcropping. The concrete has been severely undermined and pitted. The downstream channel is choked with branches and fallen trees.

j. Regulating Structures

A 16" cast iron pipe exists which allows the pond to be drained. The control of the pipe are located such that they would not be accessible during a flood. The 16" pipe, even if opened during a flood, would not significantly affect the reservoir level.

c. Elevation Data

	Elevation (feet above MSL)
Top of Dam (Maximum)	725.1
Test Flood (1/2 PMF)	723.1
Top of Dam (Minimum)	722
Spillway Crest	719.8
Normal Pool	717
Streambed at Centerline of Dam	705±

d. Reservoir Data

	Feet
Length of Normal Pool	2640±
Length of Test Flood Pool	3700±

e. Storage Data

	Acre-Feet
Normal Pool	322
Top of Dam (Minimum)	417
Test Flood (1/2 PMF)	530

f. Reservoir Surface Area

	Acres
Normal Pool	26
Top of Dam (Minimum)	40±
Test Flood (1/2 PMF)	42±

g. Dam

(1) Type

Earth Dam

(2) Length

1950 (approximately) feet

(3) Height

26 feet

(4) Top Width

14 feet

(5) Side Slopes

Upstream: 1.75H to 1V
Downstream: 4H to 1V

i. Normal Operation Procedure(s)

The South Reservoir stores water to augment the North Reservoir. When the North Reservoir cannot keep up with the water demand from the City, water is pumped from the South Reservoir to the North Reservoir.

1.3 Pertinent Data

a. Drainage Area

The drainage basin of the southern St. Albans Reservoir lies within the towns of Fairfax, Fairfield and St. Albans, Vermont. The basin encompasses approximately 2.28 square miles, of which 1.83 square miles is the drainage basin of the northern St. Albans Reservoir. The basin is roughly oval shaped with a general north-south trend.

The predominant soils within the drainage basin belong to the Lyman-Marlow-Peru, the Marlow-Peru, and the Peru associations. These are soils which were formed in the upland glacial tills. Hydrologically, these soils can be classified as C soils.

The major water course within the drainage basin is an unnamed tributary to the Mill River.

b. Discharge at the Dam Site

(1) Outlet Works

The primary outlet for the reservoir is a concrete chute spillway located at the southern end of the main earth fill portion of the dam. In addition to the spillway, water could be released by means of a gated 16" pipe which acts as a pond drain, or pump up to the North Reservoir.

(2) Maximum Known Flood at Dam Site

No records nor recollections of any flooding having occurred at the site could be found.

(3) Spillway Capacity

The capacity of the spillway at a reservoir elevation of 722 feet above MSL (the point at which the dam will overtop) is 310 cfs.

The St. Albans Reservoir Dam (South) is generally overgrown with brush and shrubs except for a grass roadway along the crest which is mowed. The upstream face at the waterline is covered with riprap.

Appurtenant to the dam is an intake and gatehouse, a valve chamber structure at the downstream toe of the dam, and a concrete spillway channel. In addition, there is a pump house immediately downstream from the dam.

c. Size Classification

The St. Albans Reservoir Dam (South) impounds about 26 acres of water. The maximum storage potential of the dam is 417 acre-feet. The height of the dam is 26 feet. The Army Corps of Engineers recommends that dams with a maximum storage volume of greater than 50 acre-feet but less than 1000 acre-feet or a height of greater than 25 feet but less than 40 feet be classified as small. In the case of this dam both criteria apply; the dam is classified as small.

d. Hazard Classification

A failure of St. Albans Reservoir Dam (South) would potentially destroy the pumping station immediatley below the dam, and would damage a bridge on Town Highway 17. The hazard classification is therefore "significant."

e. Ownership

The owner of the St. Albans Reservoir (South) is:

The City of St. Albans
St. Albans Water Department
St. Albans, Vermont 05478

Attention: City Manager

f. Operator

The dam is operated by the St. Albans Water Department. Contact Mr. William Scott, Public Works Director, City Hall, St. Albans, Vermont 05478. Telephone 802-524-4830.

g. Purpose

The St. Albans Reservoir Dam (South) is a water supply for the City of St. Albans.

h. Design and Construction History

Little information is available on the design and construction history of the St. Albans Reservoir Dam (South) except the date of construction - 1873.

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT
NAME OF DAM: ST. ALBANS RESERVOIR DAM (SOUTH)

SECTION 1: PROJECT INFORMATION

1.1 General

a. Authority

Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a National Program of Dam Inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Dufresne-Henry Engineering Corporation has been retained by the New England Division to inspect and report on selected dams in the State of Vermont. Authorization and notice to proceed were issued to Dufresne-Henry Engineering Corporation under a letter of May 26, 1978 from Ralph T. Garver, Colonel, Corps of Engineers. Contract No. DACW33-78-C-0341 has been assigned by the Corps of Engineers for this work.

b. Purpose

1. Perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.

2. Encourage and prepare the states to initiate quickly effective dam safety programs for non-Federal dams.

3. To update, verify and complete the National Inventory of Dams.

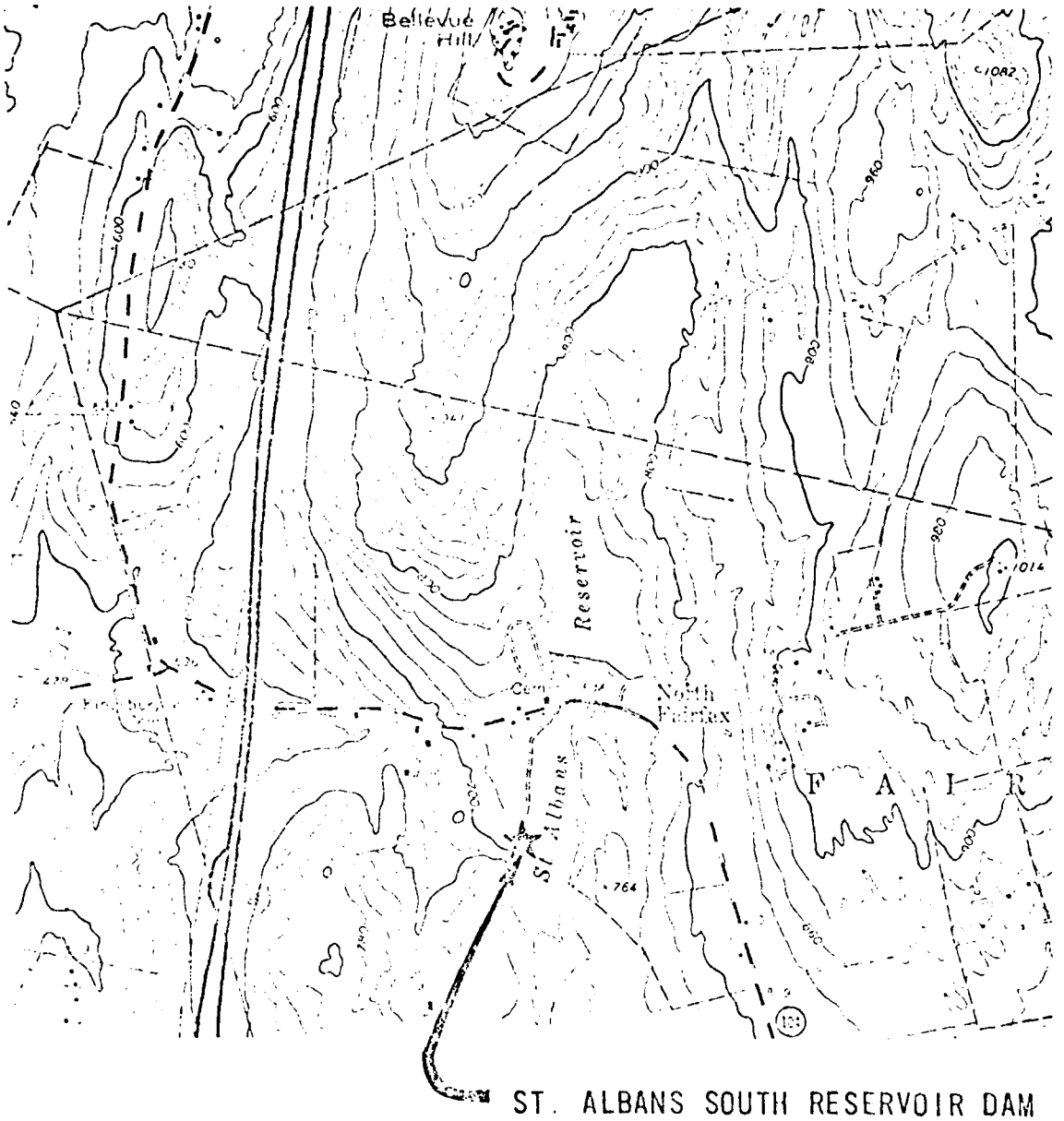
1.2 Description of Project

a. Location

The St. Albans Reservoir is located in the Town of Fairfax, Franklin County, Vermont. The reservoir is about 3.5 miles south of St. Albans on Route 104, and is tributary to the Mill River.

b. Description of Dam and Appurtenances

The St. Albans Reservoir Dam (South) is an earth fill dam which creates an impoundment that was originally the primary drinking water source for the City of St. Albans. Presently the South Reservoir serves to augment the water storage in the North Reservoir.

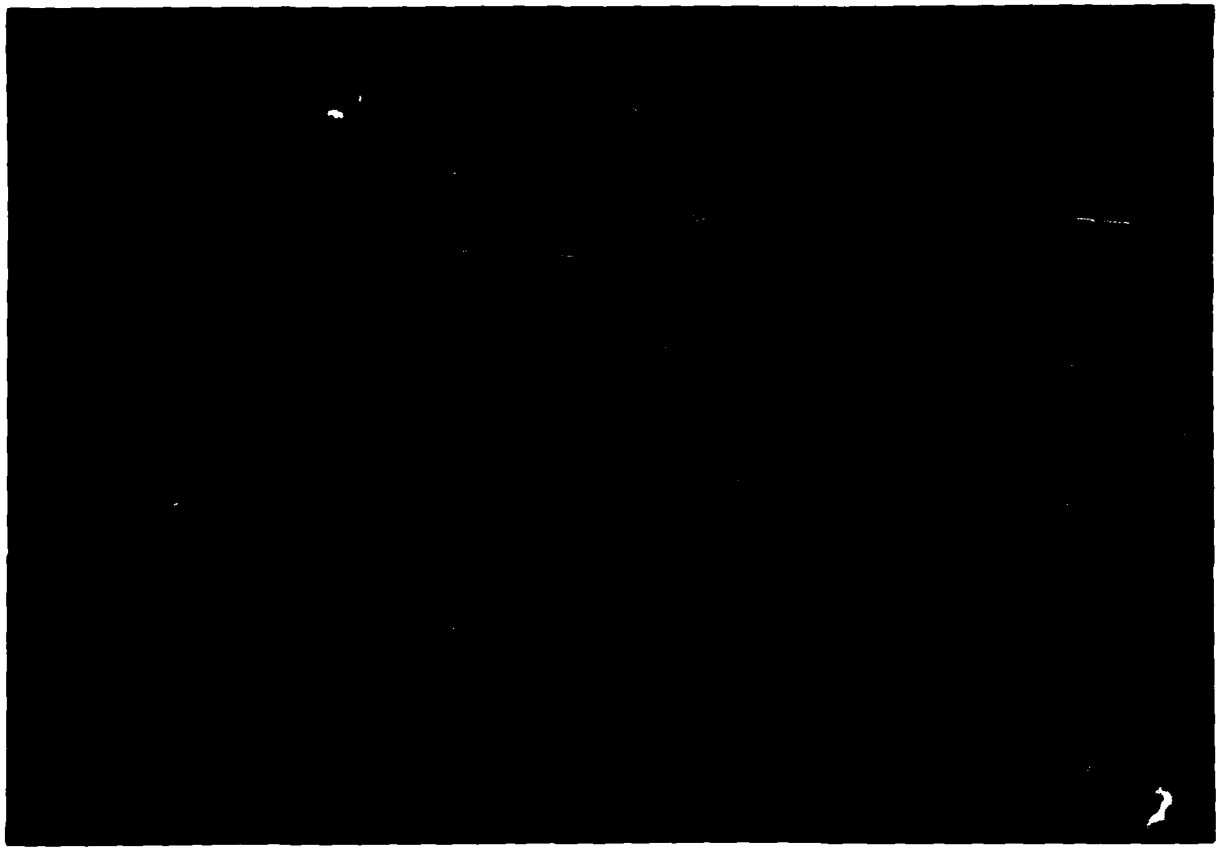


ST. ALBANS SOUTH RESERVOIR DAM

MAP SOURCE:

U.S. GEOLOGICAL SURVEY
ST. ALBANS QUADRANGLE
VERMONT
7.5 MIN SERIES
1:2400 1964

CLIENT NO	22-0557	DUFRESNE-HENRY ENGINEERING CORP.		
PROJ ENG	JRS	LOCATION MAP		
DRAWN BY	RB	ST. ALBANS SOUTH RESERVOIR		
DATE	9-6-78	FAIRFAX	VERMONT	A 6015



OVERVIEW PHOTO

ST. ALBANS RESERVOIR DAM (SOUTH)

(NOTE ABNORMALLY LOW WATER LEVEL)

d. Post-Construction Changes

There are no records available indicating changes to the dam embankment since it was constructed in 1873. In 1969, however, a pump house was constructed at the downstream toe near the original outlet works and the piping from the outlet works was directed to the new pump house.

e. Seismic Stability

The dam is located in Seismic Zone No. 2 and in accordance with recommended Phase I guidelines does not warrant seismic analysis.

SECTION 7: ASSESSMENT, RECOMMENDATIONS/ REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition

Based on the visual inspection and the past operational record, the dam is judged to be in fair condition. However, the following conditions, if not remedied will cause the dam to deteriorate rapidly in the future:

1. Presence of large trees and stumps on the embankment.
2. Poor condition of the spillway.
3. Evidence of erosion along downstream slope at the right spillway training wall.
4. Apparent wave cutting action between top of riprap and the crest of the dam.
5. The overtopping potential of the dam in the test flood.

b. Adequacy of Information

Information necessary to formally analyze the stability of the dam such as cross sections and "AS-BUILT" construction drawings was not available and therefore evaluation of the stability of the dam was based solely on visual observations.

c. Urgency

The recommendations presented in Section 7.2 should be implemented within one year of receipt of the Phase I Inspection Report, unless an inspection of the dam, with a full reservoir, indicates that more immediate action is necessary.

d. Necessity for Additional Information

The Owner should perform the additional investigations recommended in Section 7.2.

7.2 Recommendations

An engineer experienced in the design of dams should be engaged to:

1. Perform an inspection of the downstream slope and toe when the reservoir is full to observe possible seeps or wet areas.

2. Develop a procedure for the removal of trees and shrubs from the dam and for planting of grasses to control erosion at the crest and downstream slope.

3. Provide design recommendations for the rehabilitation of the spillway retaining walls, channel and training walls.

4. Recommend procedures for placing riprap in the top portion of the upstream slope.

5. Investigate methods of increasing the spillway capacity or alternately installing an emergency draw-down structure, or increasing the elevation of the crest of the dam which presently is not consistent along the length of the embankment.

7.3 Remedial Measures

a. Alternatives

Not applicable.

b. Operating and Maintenance and Procedures

The following items should be included in a systematic dam maintenance program to be performed annually by the Owner.

1. The trees and brush growing on the dam should be removed periodically.

2. The spillway should be maintained clear of debris.

3. All operating valves appurtenant to the dam should be kept workable.

A bi-annual technical inspection should be performed after implementation of the recommendations contained in 7.2. A system for warning downstream residents in the event of an emergency condition should be formalized and implemented.

APPENDIX A

VISUAL INSPECTION CHECK LIST

VISUAL INSPECTION CHECK LIST
PARTY ORGANIZATION

PROJECT ST. ALBANS RESERVOIR DAM (SOUTH) DATE August 18, 1978

TIME 12:00 Noon

WEATHER Clear

W.S. ELEV._____U.S.____DN.S.
Lake lowered for removal of sludge

PARTY:

1.	G. Castro GEI	6.	
2.	W. Fisher GEI	7.	
3.	M. J. Chenette D-H	8.	
4.		9.	
5.		10.	

	PROJECT FEATURE	INSPECTED BY	REMARKS
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

PERIODIC INSPECTION CHECK LIST

PROJECT ST. ALBANS RESERVOIR DAM (SOUTH) **DATE** August 18, 1978

PROJECT FEATURE _____ **NAME** W. R. Fisher

DISCIPLINE _____ **NAME** _____

AREA EVALUATED	CONDITION
DIKE EMBANKMENT	
Crest Elevation	
Current Pool Elevation	
Maximum Impoundment to Date	
Surface Cracks	None observed.
Pavement Condition	Not applicable.
Movement or Settlement of Crest	Alignment of crest appears to have been controlled by the ground contours prior to construction and, therefore, is irregular.
Lateral Movement	None apparent.
Vertical Alignment	Surfaces too irregular to judge.
Horizontal Alignment	Surfaces too irregular to judge.
Condition at Abutment and at Concrete Structures	Good at gatehouse structure and both abutments but very poor at spillway.
Indications of Movement of Structural Items on Slopes	None apparent.
Trespassing on Slopes	None apparent.
Sloughing or Erosion of Slopes or Abutments	Minor sloughing of riprap on upstream slope. Erosion has occurred at the top of riprap on upstream slope and on the downstream slope adjacent to the right spillway training wall.
Rock Slope Protection - Riprap Failures	Minor sloughing and absence of riprap for a height of 2 to 4 feet below the crest of the dam.
Unusual Movement or Cracking at or near Toes	None apparent.
Unusual Embankment or Downstream Seepage	(Elevation of) reservoir was lower than the elevation of the downstream toe.
Piping or Boils	None apparent.
Foundation Drainage Features	None known or observed.
Toe Drains	Presence of stone masonry manhole on downstream toe may indicate presence of toe drain.

PERIODIC INSPECTION CHECK LIST

PROJECT ST. ALBANS RESERVOIR DAM (South) DATE August 18, 1978

PROJECT FEATURE _____ NAME W. R. Fisher

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
DIKE EMBANKMENT continued	
Instrumentation System	None known.
Vegetation	Upstream Slope: From riprap to crest of dam is covered with shrubs and small trees from right abutment to gatehouse. Crest: From right abutment to gatehouse the crest is grass covered. From gatehouse to left abutment the crest is overgrown with very large trees. Downstream Slope: Generally overgrown with shrubs and very large trees.

PERIODIC INSPECTION CHECK LIST

PROJECT ST. ALBANS RESERVOIR DAM (South) **DATE** August 18, 1978

PROJECT FEATURE _____ **NAME** W. R. Fisher

DISCIPLINE _____ **NAME** _____

AREA EVALUATED	CONDITION
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
a. Approach Channel	
General Condition	Not applicable.
Loose Rock Overhanging Channel	Not applicable.
Trees Overhanging Channel	Not applicable.
Floor of Approach Channel	Not applicable.
b. Weir and Training or Sidewalls	
General Condition of Concrete	Very poor. Some blocks have fallen from the walls.
Rust or Staining	
Spalling	
Any Visible Reinforcing	
Any Seepage or Efflorescence	
Drain Holes	None apparent.
c. Discharge Channel	
General Condition	Very poor.
Loose Rock Overhanging Channel	Loose rock from training walls could fall into channel.
Trees Overhanging Channel	Many several inches in diameter.
Floor of Channel	Concrete for 95 feet, then bedrock.
Other obstructions	Two large holes exist in concrete floor. One large tree and numerous branches have fallen into the channel.

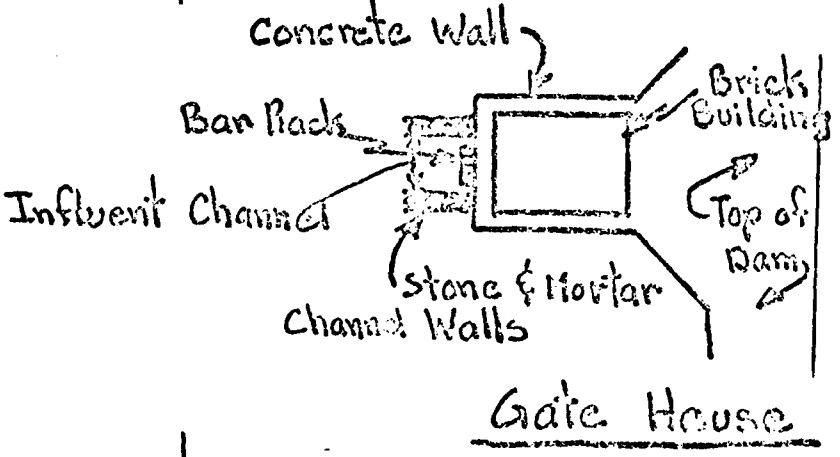
PERIODIC INSPECTION CHECK LIST

PROJECT ST. ALBANS RESERVOIR DAM (SOUTH) DATE August 18, 1978

PROJECT FEATURE Intake NAME M. J. Chenette

DISCIPLINE NAME

AREA EVALUATED	CONDITION
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	
a. Approach Channel	
Slope Conditions	Intake could not be assessed because the gatehouse was boarded up.
Bottom Conditions	
Rock Slides or Falls	
Log Boom	The following sketch of the structure shows the relative location and components of the intake.
Debris	
Condition of Concrete Lining	
Drains or Weep Holes	
b. Intake Structure	
Condition of Concrete	
Stop Logs and Slots	



PERIODIC INSPECTION CHECK LIST

PROJECT ST. ALBANS RESERVOIR DAM (SOUTH) **DATE** August 18, 1978

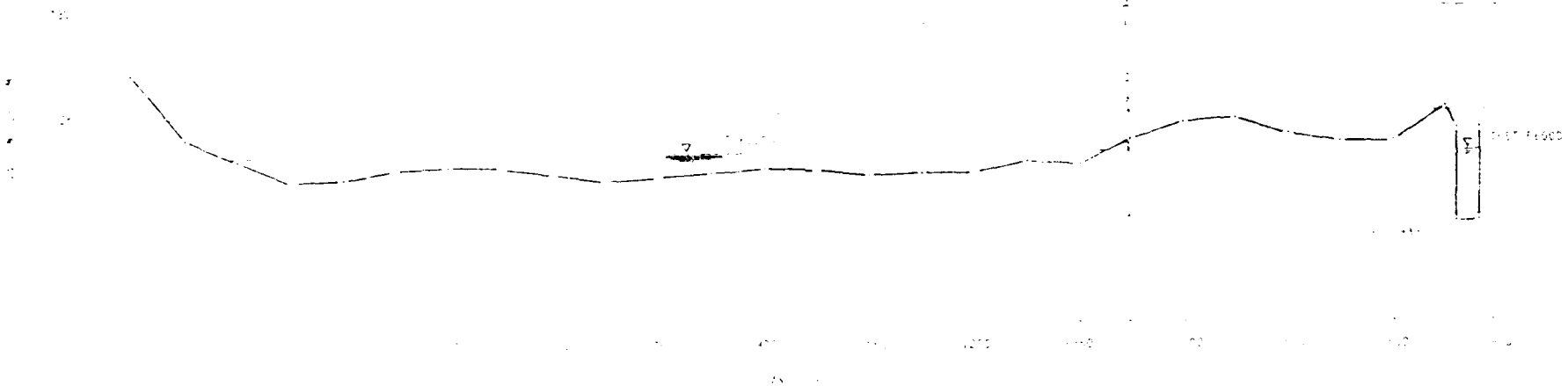
PROJECT FEATURE Intake **NAME** M. J. Chenette

DISCIPLINE _____ **NAME** _____

AREA EVALUATED	CONDITION
OUTLET WORKS - CONTROL TOWER	
a. Concrete and Structural	
General Condition	Fair. (Brick) Some loose bricks.
Condition of Joints	N/A
Spalling	N/A
Visible Reinforcing	N/A
Rusting or Staining of Concrete	N/A
Any Seepage or Efflorescence	N/A
Joint Alignment	N/A
Unusual Seepage or Leaks in Gate Chamber	N/A
Cracks	N/A
Rusting or Corrosion of Steel	N/A
b. Mechanical and Electrical	
Air Vents	N/A
Float Wells	N/A
Crane Hoist	N/A
Elevator	N/A
Hydraulic System	N/A
Service Gates	N/A
Emergency Gates	N/A
Lightning Protection System	N/A
Emergency Power System	N/A
Wiring and Lighting System	N/A

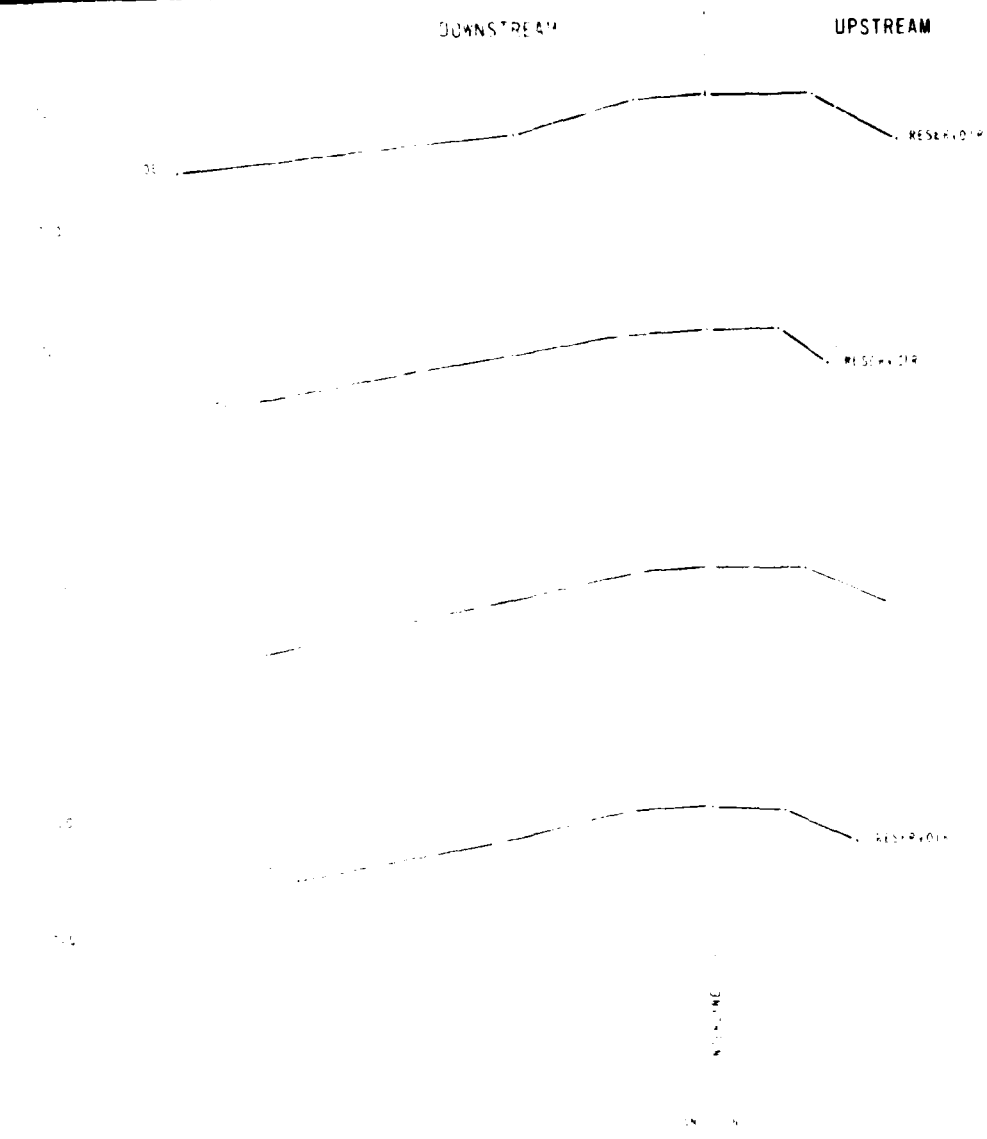
APPENDIX B

PROJECT RECORDS AND PLANS



DUFRESNE-HENRY ENGINEERING CORP.	U.S. ARMY ENGINEER DIV., NEW ENGLAND

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS
ST. ALBANS (SOUTH) RESERVOIR
TOP OF DAM PROFILE AND
TEST FLOOD



DUFRESNE-HENRY ENGINEERING CORP.	U.S. ARMY ENGINEER DIV., NEW ENGLAND

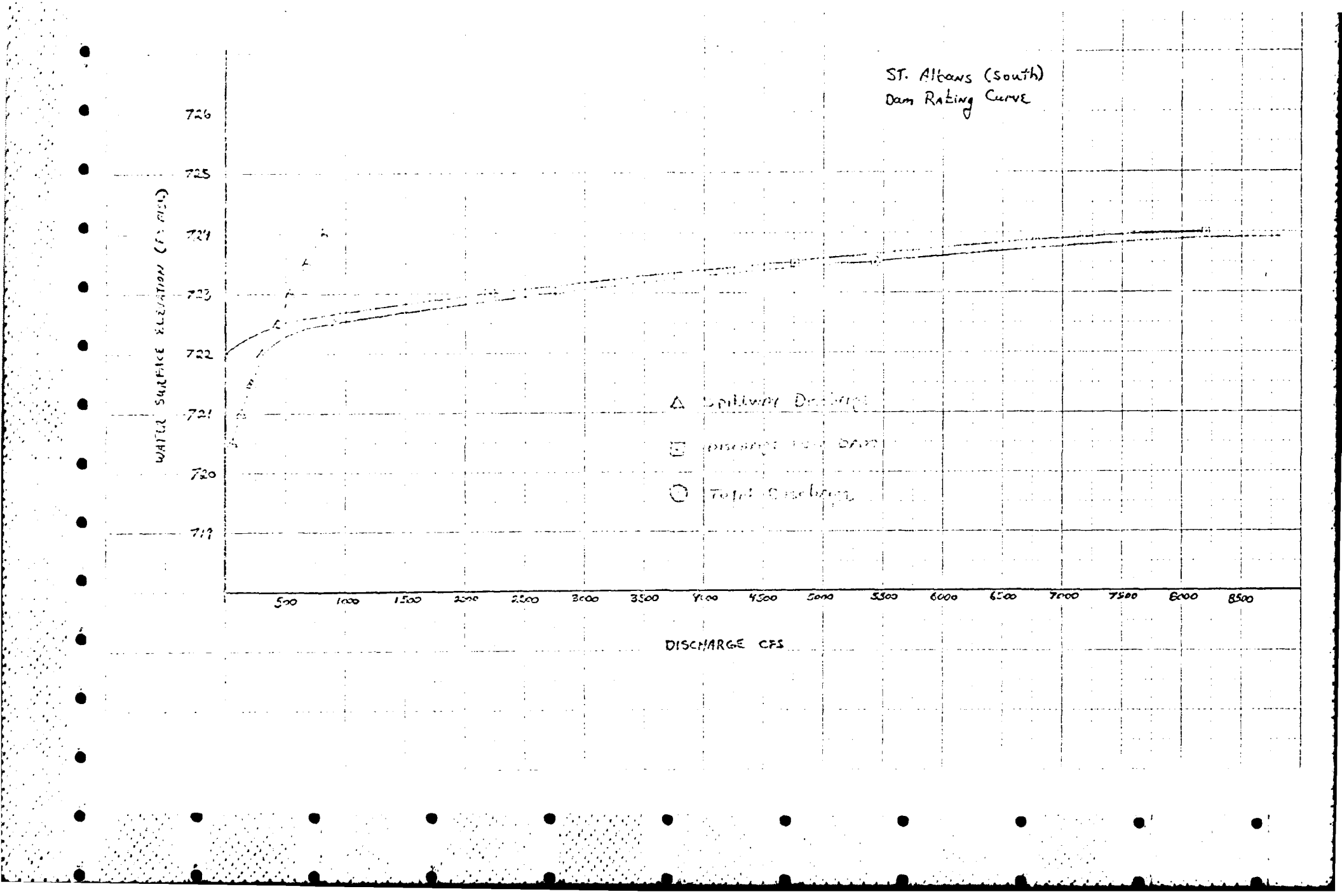
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAM

CROSS SECTIONS

APPENDIX C

PHOTOGRAPHS

1. Crest of Dam.
2. Dam and Gatehouse. Note Low Water Level on Date of Inspection.
3. Gatehouse and Riprap on Upstream Face of Dam.
4. Riprap on Upstream Face of Dam.
5. Valve Chamber at Toe of Dam.
6. Pumping Station Immediately Below Dam for Pumping Water to North Reservoir.
7. Holes, Borrows or Channels at Toe of Upstream Slope.
8. Possible Toe Drain Manhole, Abandoned.
9. Water Seeping Into Reservoir at Toe of Upstream Slope. Note that the Reservoir had been Drained.
10. Outlet Pipe from Reservoir.
11. Entrance to Spillway.
12. Spillway Training Wall.
13. Hole in Concrete Spillway.
14. Debris in Channel Downstream of Spillway.


ST. Albans (south)
Dam Rating Curve
726
725
724
723
722
721
720
719
WATER SURFACE ELEVATION (FT. MSL)
500
1000
1500
2000
2500
3000
3500
4000
4500
5000
5500
6000
6500
7000
7500
8000
8500
DISCHARGE CFS

[illegible] spillway weir [illegible] be considered as a [illegible] weir, 34 feet in length, with [illegible] 1.5 to 1 sloping downstream face and a vertical upstream face. The best approximation [illegible] C value [illegible] taken from King & Brater's Handbook of Hydraulics, Table 5-7.

$$Q = CLH^{3/2}$$

[illegible] ([illegible])	Weir Length L (ft)	C	Head H (ft)	Discharge Q (cfs)
19.8	—	—	0	0
[illegible].5	34	2.78	0.7	55
21	34	2.78	1.2	155
21.5	34	2.78	1.7	210
22.0	34	2.78	2.2	310
[illegible]	34	2.78	2.7	420
22	34	2.78	3.2	540
[illegible]	34	2.78	3.7	670
[illegible]	34	2.78	4.2	810

The dam [illegible] with a [illegible] of 15'. C values [illegible] from Table 5-3 of King & Brater's [illegible].

$$Q = CAH_{(avg)}^{1/2}$$

[illegible]	Area A ([illegible])	[illegible] L (ft)	H (max) ([illegible])	C	Discharge Q (cfs)
	—	—	—	·	0
	[illegible]	[illegible]	0.5	2.7	470
	841	[illegible]	1.0	2.63	[illegible]
	1474	[illegible]	1.5	2.635	[illegible]
	[illegible]	1550	2.0	2.63	[illegible]

DUFRESNE-HENRY ENGINEERING CORPORATION

SUBJECT Hydrologic Data
St. Albans Reservoir (South)

SHEET NO. 1 OF 1
JOB NO. 22-0556

Albans Reservoir South

Drainage Area = 2.28 sq. mi. or 0.45 sq. mi. if N. Reservoir is excluded.
Pond Surface Area = 96 acres

Soils: Lyman, Marlow, Peru: Type C

Dam size: Small
Hazard classification: Significant
Test Flood: ½ PMF

Soil Retention Rate = 0.12 in/hr

$$t_p = 2.2\left(\frac{L \cdot L_c}{\sqrt{S}}\right)^{0.37}$$

L = hydraulic length
L_c = length to centroid @ 0.6L
S = Avg. slope (ft/mi)

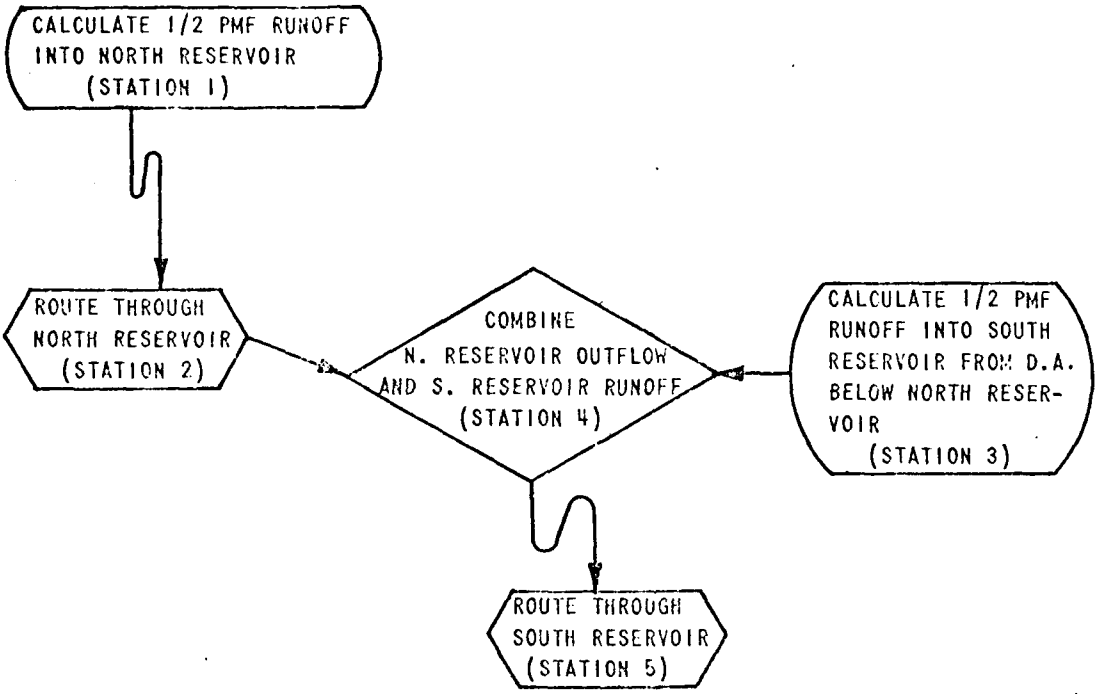
to be calc.

$$t_p = 2.2\left(\frac{0.95 \cdot 0.57}{\sqrt{129.7}}\right)^{0.37}$$

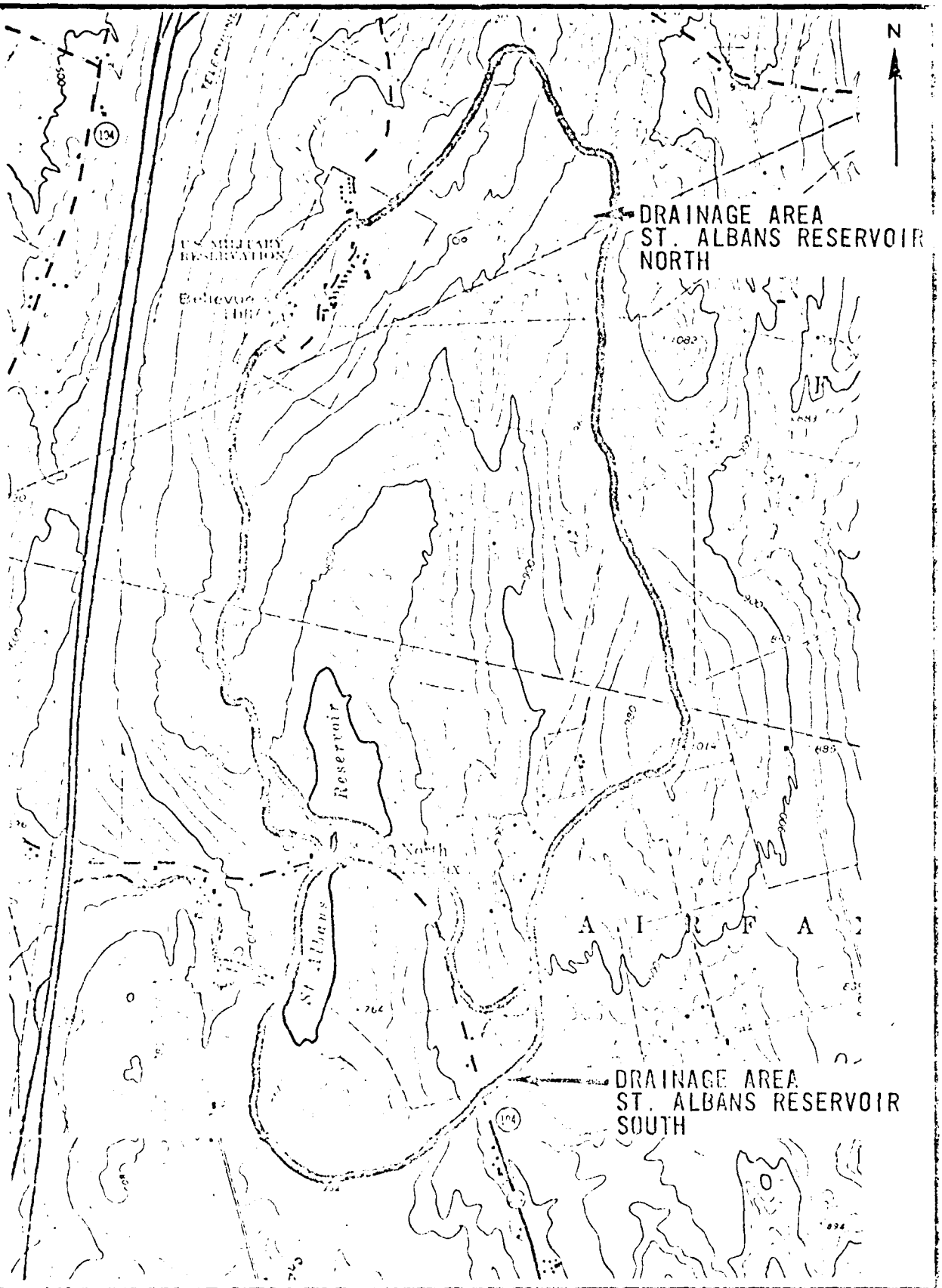
$$t_p = 0.47 \text{ hrs.}$$

Time $t_n = \frac{t_p}{5.5} = 0.12 \text{ hrs} = 7.3 \text{ minutes}$

Note for HEC-1 use 10 minute intervals over 24 hrs.



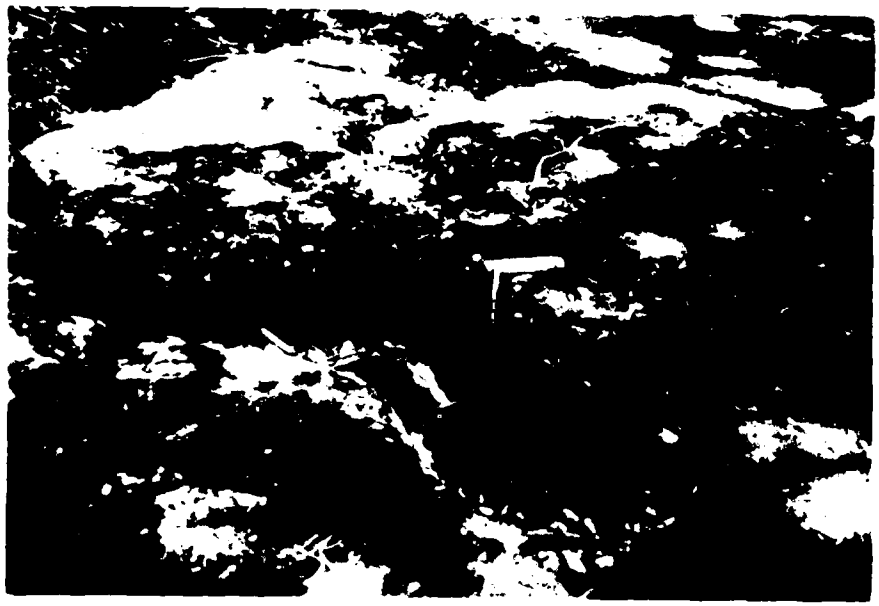
JECT NO	22-0557	DUFRESNE-HENRY ENGINEERING CORP.	
ROJ ENG	EJS	ST. ALBANS RESERVOIR	
RAWN BY	RB	HEC-1 SCHEMATIC FOR SOUTH RESERVOIR	
ATE	9-13-78		A 8082



22-0557	DUQUESNE HENRY ENGINEERING CORP.	
JRS	DRAINAGE AREA	
KB	ST. ALBANS RESERVOIR NORTH & SOUTH	
9-14-78		AT 603

APPENDIX D

HYDRAULIC COMPUTATIONS



#13 HOLE IN CONCRETE SPILLWAY.

#14 DEBRIS IN CHANNEL DOWNSTREAM OF SPILLWAY.

#11 ENTRANCE TO SPILLWAY.

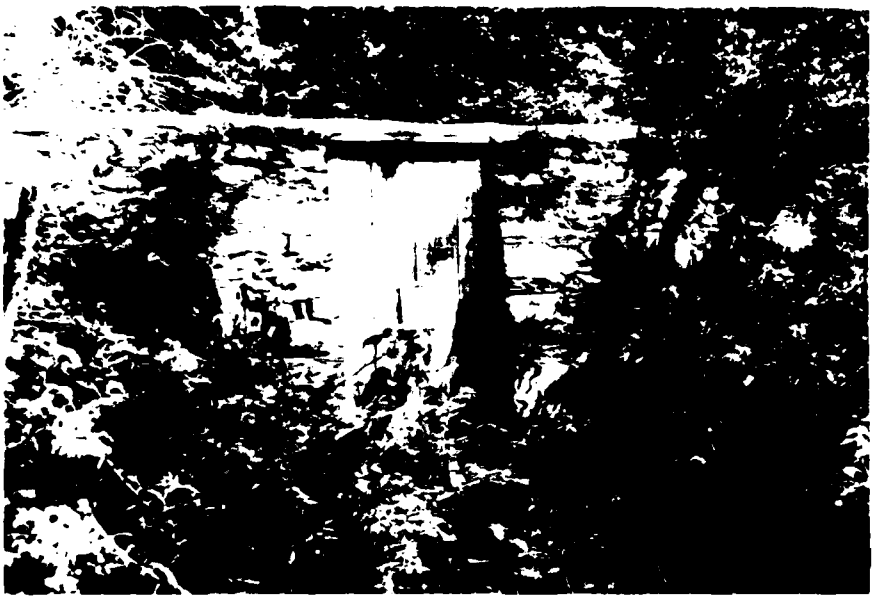
#12 SPILLWAY TRAINING WALL.

#9 WATER SEEPING INTO RESERVOIR AT TOE OF UPSTREAM SLOPE. NOTE THAT THE RESERVOIR HAD BEEN DRAINED.

#10 OUTLET PIPE FROM RESERVOIR.

#7 HOLES, BORROWS OR CHANNELS AT TOE OF UPSTREAM SLOPE.

#8 POSSIBLE TOE DRAIN MANHOLE, ABANDONED.



#5 VALVE CHAMBER AT TOE OF DAM.

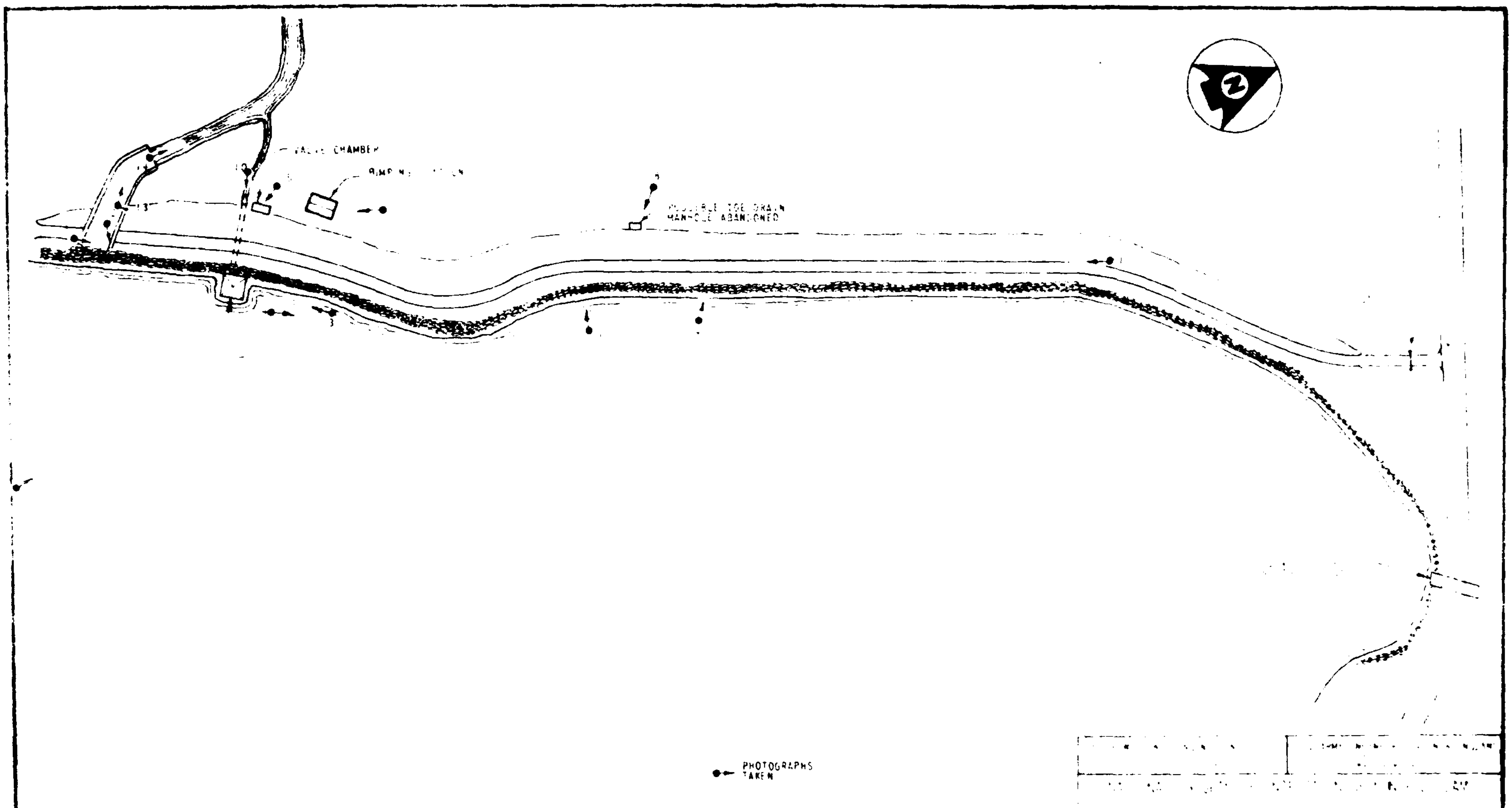
#6 PUMPING STATION IMMEDIATELY BELOW DAM FOR PUMPING WATER TO NORTH RESERVOIR.

#3 GATEHOUSE AND RIPRAP ON UPSTREAM FACE OF DAM.

#4 RIPRAP ON UPSTREAM FACE OF DAM.

#1 CREST OF DAM.

#2 DAM AND GATEHOUSE. NOTE LOW WATER LEVEL ON DATE OF INSPECTION.



ST ALBANS SOUTH RESERVOIR DAM

DUFRESNE-HENRY ENGINEERING CORPORATION

BY EJ(Hen) SUBJECT Storage - Discharge Relations SHEET NO. ____ OF ____

DATE ____ St. Albans (South) JOB NO. 22-0557

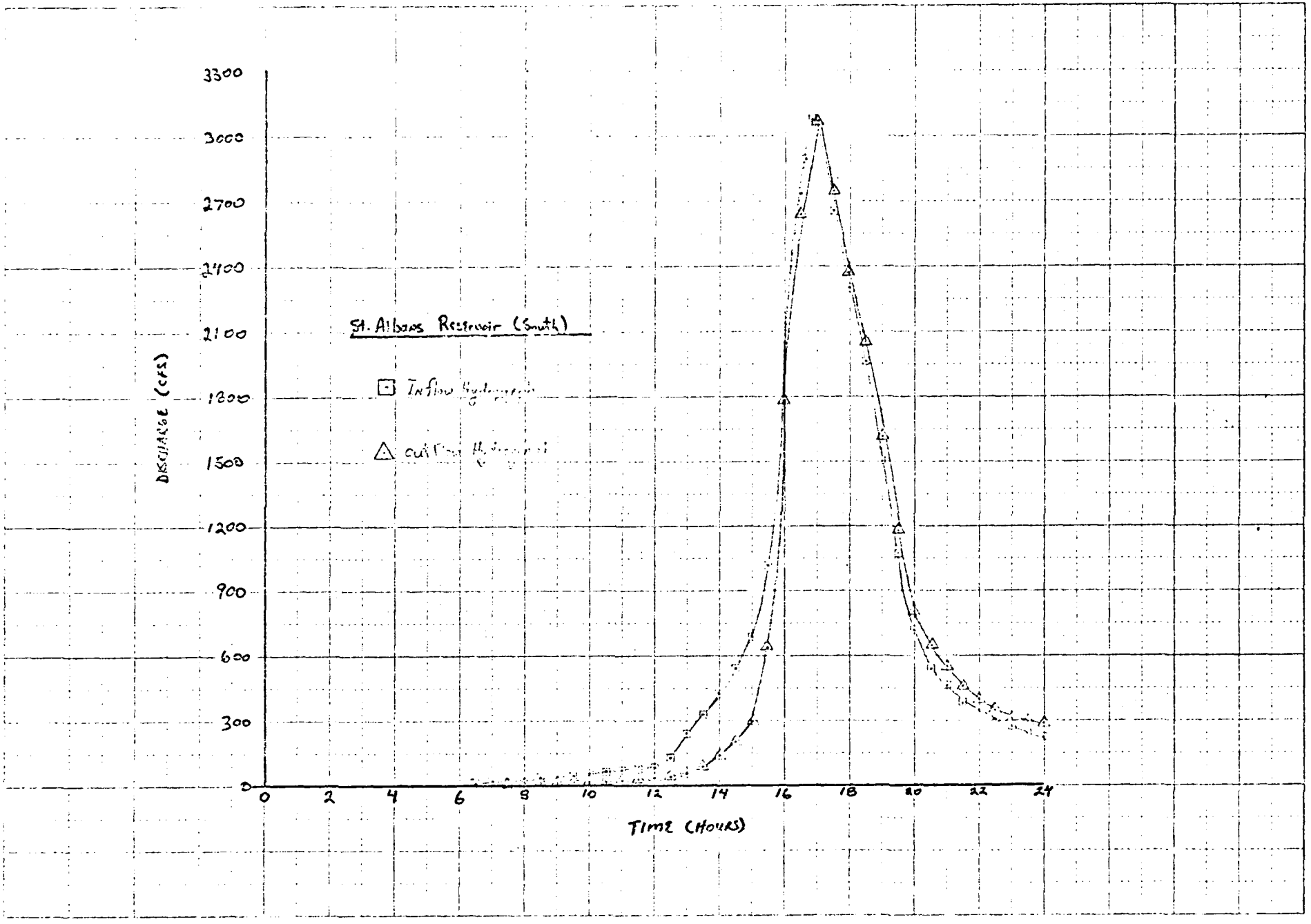
Storage - Discharge Rating Curve for St. Albans Reservoir (South)

Surface Area at Normal Pool (Elevation 717) = 26 Acres
Storage at Normal Pool (Elevation 717) = 322 Acre-feet

Surface area at Elevation 720 = 34 Acres
Storage at Elevation 720 = 424 Acre Feet

Storage is assumed to be an average of 17 Acre feet additional storage per 0.5 feet of increase in water surface elevation.

Water Surface Elevation (Ft., MSL)	Storage (Acre Feet)	Discharge (CFS)
717	322	0
719.8	417	0
720.5	441	55
721	458	125
721.5	475	210
722	492	310
722.5	509	765
723	526	2390
723.5	543	4790
724	560	7745


St. Albans Reservoir (South)
Inflow Hydrograph
Outflow Hydrograph
DISCHARGE (CFS)
3300
3000
2700
2400
2100
1800
1500
1200
900
600
300
0
0
2
4
6
8
10
12
14
16
18
20
22
24
TIME (HOURS)

****
HEC-1 VERSION DATED JAN 1973
UPDATED AUG 74
CHANGE NO. 01
****

SPILLWAY DESIGN FLOOD
SAINT ALBANS DAM SOUTH
PHASE I DAM SAFETY INVESTIGATION

JOB SPECIFICATION

NO	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
144	0	10	1	0	0	0	2	0	0

JOPER	NRT
3	0

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

PROBABLE MAXIMUM 24-HOUR PRECIPITATION (NORTH RE

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
1	0	0	0	0	0	1

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	1.83	0.0	1.83	1.00	0.500	0	0	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.0	16.00	111.00	125.00	133.00	0.0	0.0	0.0

LOSS DATA

STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0.0	0.0	1.00	0.0	0.0	1.00	0.34	0.12	0.0	0.0

UNIT HYDROGRAPH DATA
TP= 1.30 CP=0.68 NTA= 0

RECESSION DATA
STRTQ= 0.0 QRCSN= 0.0 RTIOR= 1.00

APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 8.96 AND R= 6.11 INTERVALS

UNIT HYDROGRAPH 38 END-OF-PERIOD ORDINATES, LAG= 1.30 HOURS, CP= 0.68 VOL= 1.00

28.	104.	207.	321.	439.	538.	602.	628.	621.	545.
463.	393.	333.	283.	240.	204.	173.	147.	125.	106.
90.	76.	65.	55.	47.	39.	34.	28.	24.	20.
17.	15.	13.	11.	9.	8.	6.	6.		

END-OF-PERIOD FLOW

	TIME	RAIN	EXCS	COMP Q
1	0 10	0.02	0.00	0.
1	0 20	0.02	0.00	0.
1	0 30	0.02	0.00	0.
1	0 40	0.02	0.00	0.
1	0 50	0.02	0.00	0.
1	1 0	0.02	0.00	0.
1	1 10	0.02	0.00	0.
1	1 20	0.02	0.00	0.
1	1 30	0.02	0.00	0.

1	1	50	0.02	0.00	0.
1	1	60	0.02	0.00	0.
1	2	10	0.02	0.00	0.
1	2	20	0.02	0.00	0.
1	2	30	0.02	0.00	0.
1	2	40	0.02	0.00	0.
1	2	50	0.02	0.00	0.
1	2	60	0.02	0.00	0.
1	3	10	0.02	0.00	0.
1	3	20	0.02	0.00	0.
1	3	30	0.02	0.00	0.
1	3	40	0.02	0.00	0.
1	3	50	0.02	0.00	0.
1	3	60	0.02	0.00	0.
1	4	10	0.02	0.00	0.
1	4	20	0.02	0.00	0.
1	4	30	0.02	0.00	0.
1	4	40	0.02	0.00	0.
1	4	50	0.02	0.00	0.
1	4	60	0.02	0.00	0.
1	5	10	0.02	0.00	0.
1	5	20	0.02	0.00	0.
1	5	30	0.02	0.00	0.
1	5	40	0.02	0.00	0.
1	5	50	0.02	0.00	0.
1	5	60	0.02	0.00	0.
1	6	10	0.05	0.03	1.
1	6	20	0.05	0.03	4.
1	6	30	0.05	0.03	11.
1	6	40	0.05	0.03	22.
1	6	50	0.05	0.03	37.
1	6	60	0.05	0.03	55.
1	7	10	0.05	0.03	75.
1	7	20	0.05	0.03	96.
1	7	30	0.05	0.03	116.
1	7	40	0.05	0.03	134.
1	7	50	0.05	0.03	150.
1	7	60	0.05	0.03	163.
1	8	10	0.05	0.03	174.
1	8	20	0.05	0.03	183.
1	8	30	0.05	0.03	191.
1	8	40	0.05	0.03	198.
1	8	50	0.05	0.03	204.
1	8	60	0.05	0.03	209.
1	9	10	0.05	0.03	213.
1	9	20	0.05	0.03	216.
1	9	30	0.05	0.03	219.
1	9	40	0.05	0.03	222.
1	9	50	0.05	0.03	224.
1	9	60	0.05	0.03	226.
1	10	10	0.05	0.03	227.
1	10	20	0.05	0.03	229.
1	10	30	0.05	0.03	230.
1	10	40	0.05	0.03	231.
1	10	50	0.05	0.03	232.
1	10	60	0.05	0.03	232.
1	11	10	0.05	0.03	233.
1	11	20	0.05	0.03	233.
1	11	30	0.05	0.03	234.
1	11	40	0.05	0.03	234.
1	11	50	0.05	0.03	234.
1	11	60	0.05	0.03	235.
1	12	10	0.30	0.28	242.
1	12	20	0.30	0.28	267.
1	12	30	0.30	0.28	317.

1	12	50	0.30	0.28	702.
1	12	60	0.30	0.28	632.
1	13	10	0.36	0.34	780.
1	13	20	0.36	0.34	939.
1	13	30	0.36	0.34	1094.
1	13	40	0.36	0.34	1251.
1	13	50	0.36	0.34	1384.
1	13	60	0.36	0.34	1516.
1	14	10	0.44	0.42	1635.
1	14	20	0.44	0.42	1750.
1	14	30	0.44	0.42	1863.
1	14	40	0.44	0.42	1973.
1	14	50	0.44	0.42	2082.
1	14	60	0.44	0.42	2188.
1	15	10	1.12	1.10	2311.
1	15	20	1.12	1.10	2480.
1	15	30	1.12	1.10	2711.
1	15	40	1.12	1.10	3006.
1	15	50	1.12	1.10	3374.
1	15	60	1.12	1.10	3798.
1	16	10	0.41	0.39	4236.
1	16	20	0.41	0.39	4631.
1	16	30	0.41	0.39	4935.
1	16	40	0.41	0.39	5107.
1	16	50	0.41	0.39	5135.
1	16	60	0.41	0.39	5041.
1	17	10	0.33	0.31	4856.
1	17	20	0.33	0.31	4608.
1	17	30	0.33	0.31	4332.
1	17	40	0.33	0.31	4066.
1	17	50	0.33	0.31	3825.
1	17	60	0.33	0.31	3607.
1	18	10	0.03	0.01	3399.
1	18	20	0.03	0.01	3189.
1	18	30	0.03	0.01	2968.
1	18	40	0.03	0.01	2733.
1	18	50	0.03	0.01	2485.
1	18	60	0.03	0.01	2224.
1	19	10	0.03	0.01	1960.
1	19	20	0.03	0.01	1700.
1	19	30	0.03	0.01	1457.
1	19	40	0.03	0.01	1242.
1	19	50	0.03	0.01	1059.
1	19	60	0.03	0.01	905.
1	20	10	0.03	0.01	773.
1	20	20	0.03	0.01	662.
1	20	30	0.03	0.01	567.
1	20	40	0.03	0.01	486.
1	20	50	0.03	0.01	418.
1	20	60	0.03	0.01	360.
1	21	10	0.03	0.01	310.
1	21	20	0.03	0.01	269.
1	21	30	0.03	0.01	230.
1	21	40	0.03	0.01	197.
1	21	50	0.03	0.01	169.
1	21	60	0.03	0.01	146.
1	22	10	0.03	0.01	126.
1	22	20	0.03	0.01	109.
1	22	30	0.03	0.01	97.
1	22	40	0.03	0.01	88.
1	22	50	0.03	0.01	80.
1	22	60	0.03	0.01	73.
1	23	10	0.03	0.01	67.
1	23	20	0.03	0.01	62.
1	23	30	0.03	0.01	59.

1 23 50	0.03	0.01	53.	
1 23 60	0.03	0.01	51.	
SUM	21.36	18.48	129837.	

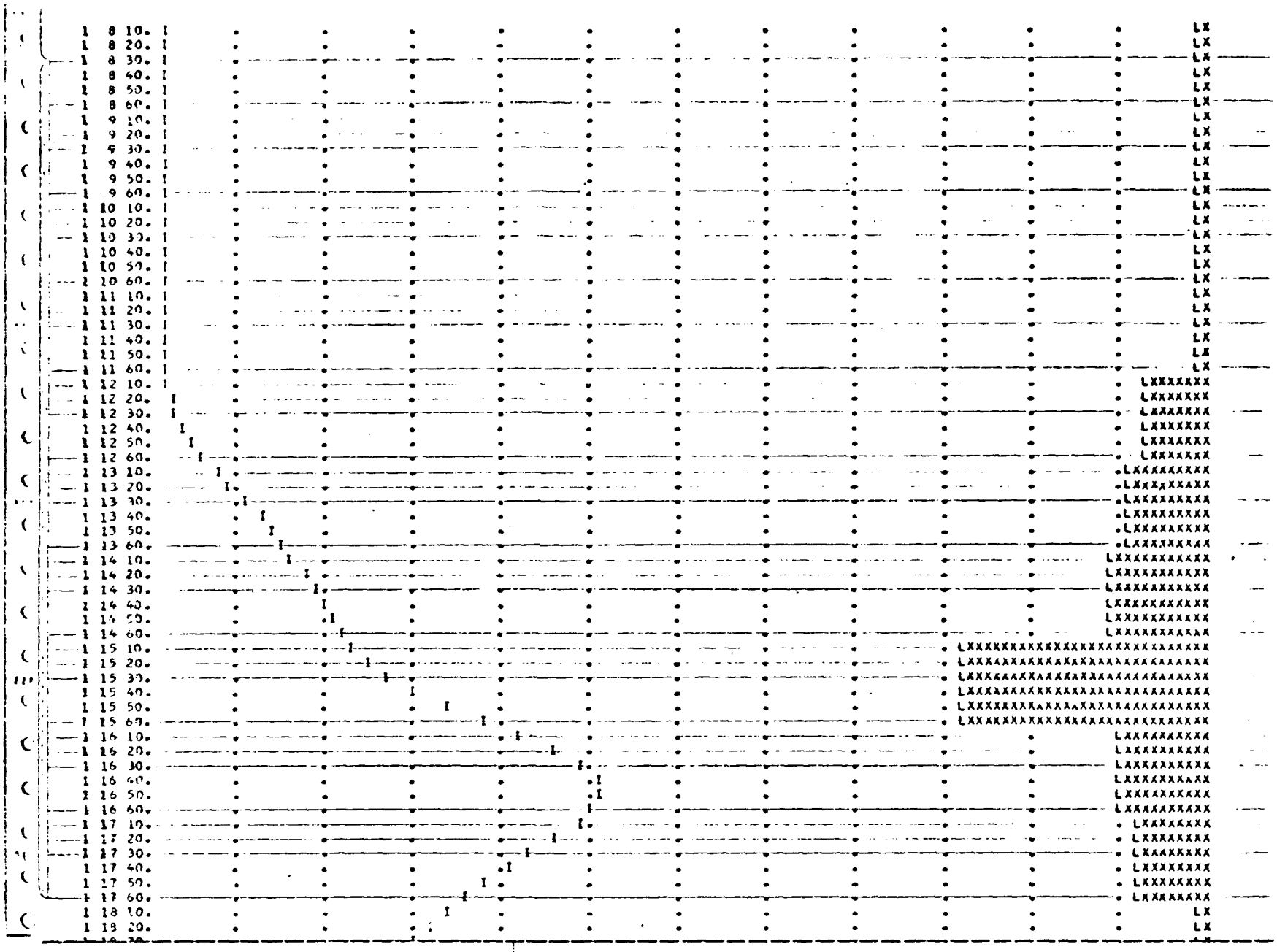
	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	5135.	3051.	902.	902.	129834.
INCHES		15.51	18.33	18.33	18.33
AC-FT		1513.	1789.	1789.	1789.

CVF

STATION 1

INFLOW*I<, OUTFLOW*O< AND OBSERVED FLOW*X*<

	0.	1000.	2000.	3000.	4000.	5000.	6000.	0.	0.	0.	0.	0.	0.
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	PRECIP&L< AND EXCESS&X< 0.8	0.4	0.0
1	0 10I												L
1	0 20I												L
1	0 30I												L
1	0 40I												L
1	0 50I												L
1	0 60I												L
1	1 10I												L
1	1 20I												L
1	1 30I												L
1	1 40I												L
1	1 50I												L
1	1 60I												L
1	2 10I												L
1	2 20I												L
1	2 30I												L
1	2 40I												L
1	2 50I												L
1	2 60I												L
1	3 10I												L
1	3 20I												L
1	3 30I												L
1	3 40I												L
1	3 50I												L
1	3 60I												L
1	4 10I												L
1	4 20I												L
1	4 30I												L
1	4 40I												L
1	4 50I												L
1	4 60I												L
1	5 10I												L
1	5 20I												L
1	5 30I												L
1	5 40I												L
1	5 50I												L
1	5 60I												L
1	6 10I												LX
1	6 20I												LX
1	6 30I												LX
1	6 40I												LX
1	6 50I												LX
1	6 60.I												LX
1	7 10.I												LX
1	7 20.I												LX
1	7 30.I												LX
1	7 40.I												LX
1	7 50.I												LX
1	7 60. I												LX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1 9 60.
1 10 10.
1 10 20.
1 10 30.
1 10 40.
1 10 50.
1 10 60.
1 11 10.
1 11 20.
1 11 30.
1 11 40.
1 11 50.
1 11 60.
1 12 10.
1 12 20.
1 12 30.
1 12 40.
1 12 50.
1 12 60.
1 13 10.
1 13 20.
1 13 30.
1 13 40.
1 13 50.
1 13 60.
1 14 10.
1 14 20.
1 14 30.
1 14 40.
1 14 50.
1 14 60.
1 15 10.
1 15 20.
1 15 30.
1 15 40.
1 15 50.
1 15 60.
1 16 10.
1 16 20.
1 16 30.
1 16 40.
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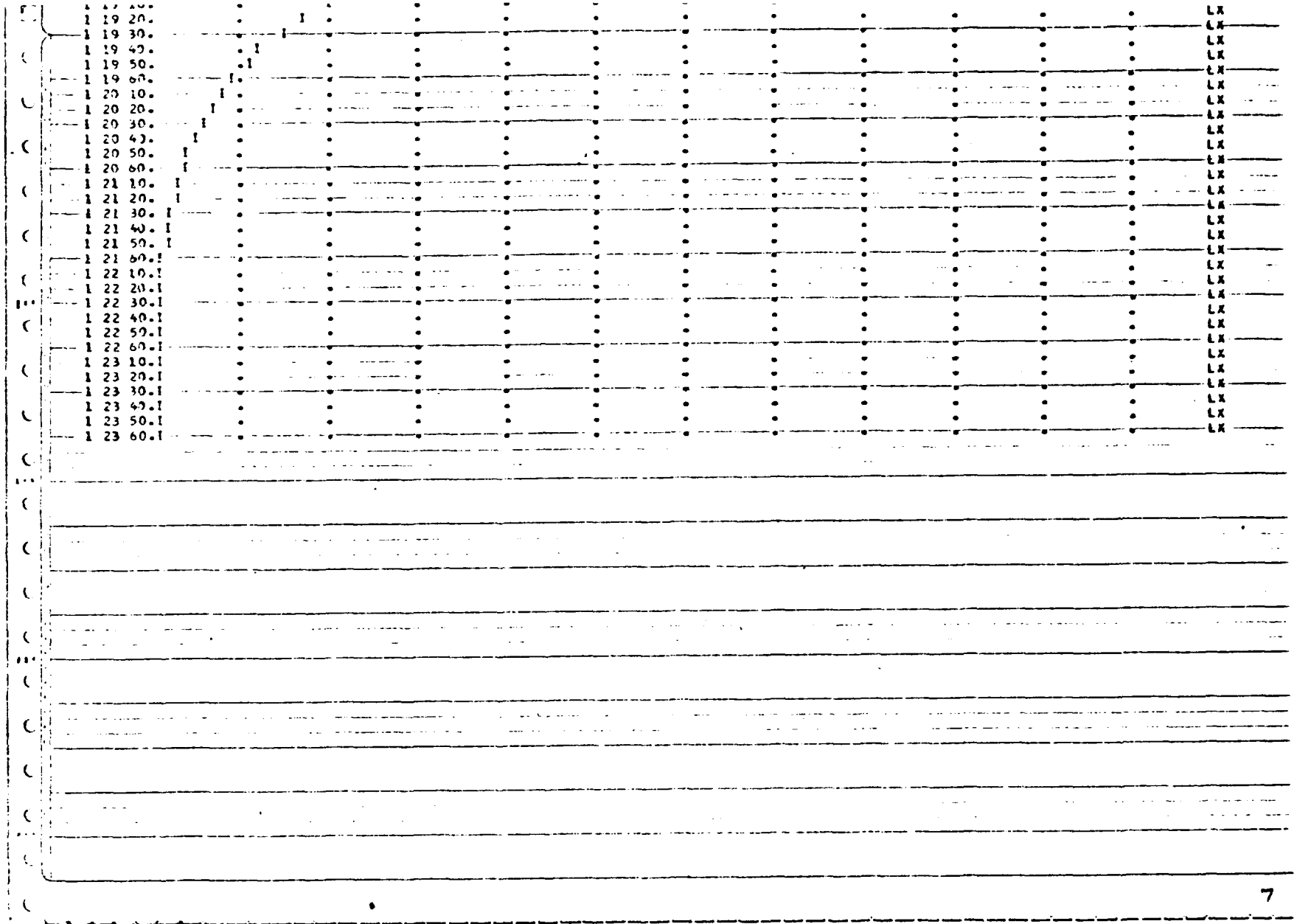
1 17 50.
1 17 60.
1 18 10.
1 18 20.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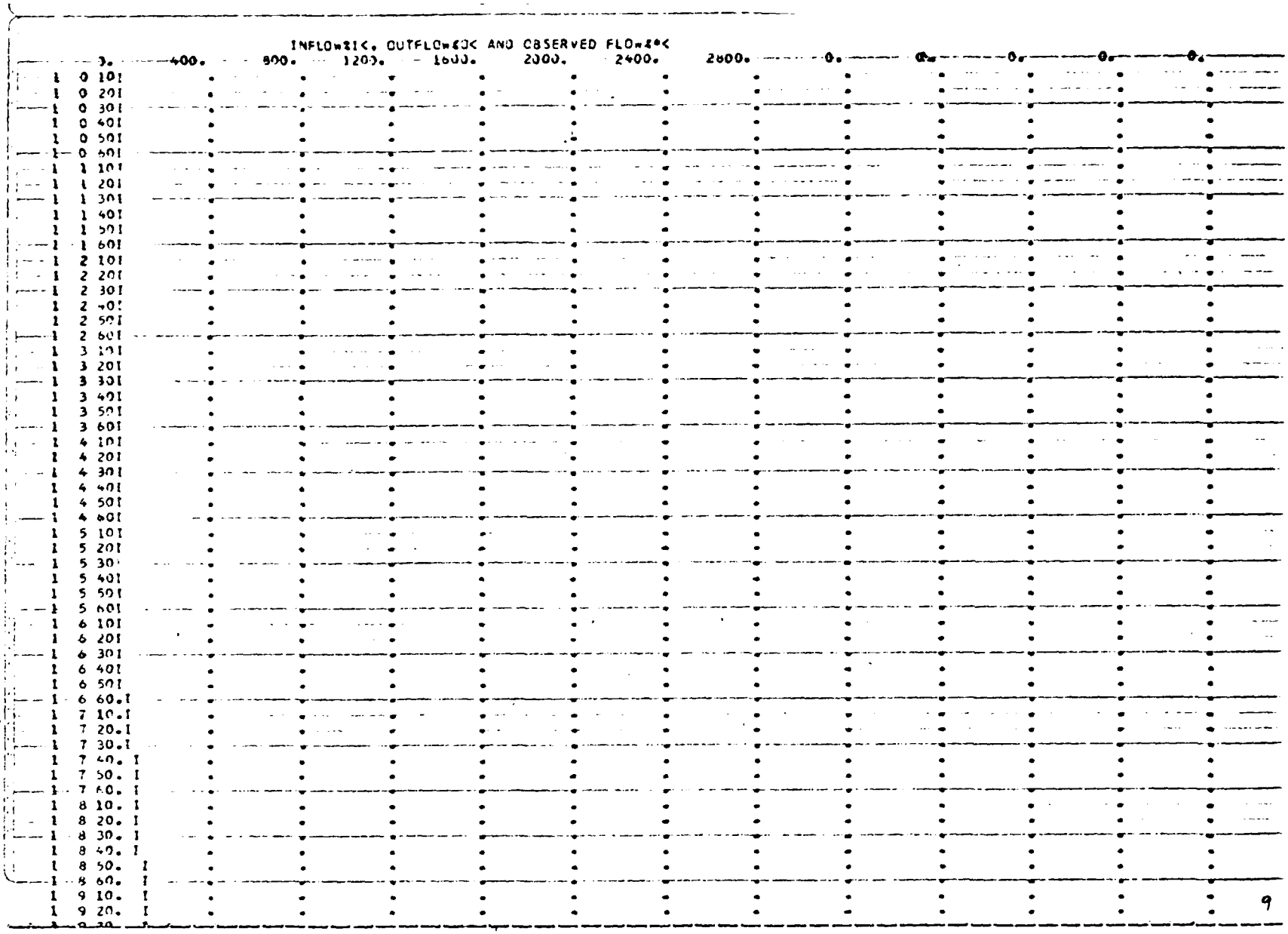
1 20 50.
1 20 60.
1 21 10.
1 21 20.
1 21 30.
1 21 40.
1 21 50.
1 21 60.
1 22 10.
1 22 20.
1 22 30.
1 22 40.
1 22 50.
1 22 60.
1 23 10.
1 23 20.
1 23 30.
1 23 40.
1 23 50.
1 23 60.

RUNOFF MULTIPLIED BY 0.50

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	2.	6.	11.
18.	27.	37.	48.	58.	67.	75.	81.	87.	92.
96.	99.	102.	104.	106.	108.	110.	111.	112.	113.
114.	114.	115.	115.	116.	116.	116.	117.	117.	117.
117.	117.	121.	134.	159.	198.	251.	316.	390.	469.
550.	625.	694.	758.	818.	875.	931.	987.	1041.	1094.
1155.	1240.	1355.	1504.	1687.	1899.	2118.	2315.	2467.	2554.
2569.	2521.	2426.	2304.	2166.	2033.	1913.	1803.	1700.	1595.
1484.	1367.	1242.	1112.	980.	850.	726.	621.	530.	452.
387.	331.	283.	243.	209.	180.	155.	134.	115.	99.
85.	73.	63.	54.	49.	44.	40.	37.	34.	31.
29.	28.	26.	25.						

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2568.	1525.	451.	451.	64918.
INCHES		7.75	9.17	9.17	9.17
AC-FT		757.	895.	895.	895.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1 0 40I
1 0 50I
1 0 60I
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1 1 30I
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1 1 50I
1 1 60I
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1 2 30I
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1 3 40I
1 3 50I
1 3 60I
1 4 10I
1 4 20I
1 4 30I
1 4 40I
1 4 50I
1 4 60I
1 5 10I
1 5 20I
1 5 30I
1 5 40I
1 5 50I
1 5 60I
1 6 10I
1 6 20I
1 6 30I
1 6 40I
1 6 50I
1 6 60.I
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1 7 20.I
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1 7 50. I
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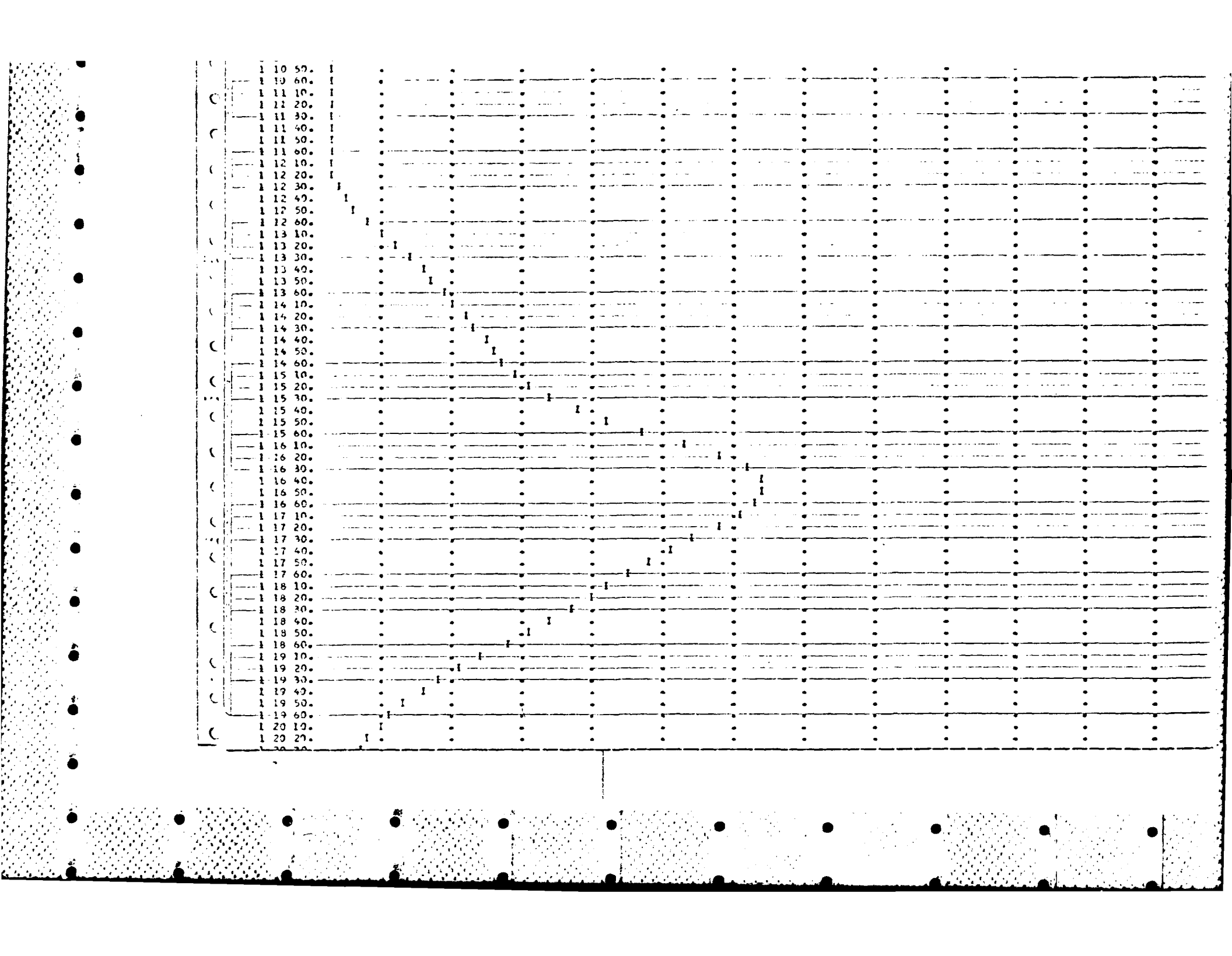
1 9 20. I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1 12 40.
1 12 50.
1 12 60.
1 13 10.
1 13 20.
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1 13 50.
1 13 60.
1 14 10.
1 14 20.
1 14 30.
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1 15 20.
1 15 30.
1 15 40.
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1 15 60.
1 16 10.
1 16 20.
1 16 30.
1 16 40.
1 16 50.
1 16 60.
1 17 10.
1 17 20.
1 17 30.
1 17 40.
1 17 50.
1 17 60.
1 18 10.
1 18 20.
1 18 30.
1 18 40.
1 18 50.
1 18 60.
1 19 10.
1 19 20.
1 19 30.
1 19 40.
1 19 50.
1 19 60.
1 20 10.
1 20 20.

```
1 21 60. 1
1 22 10. 1
1 22 20.1
1 22 30.1
1 22 40.1
1 22 50.1
1 22 60.1
1 23 10.1
1 23 20.1
1 23 30.1
1 23 40.1
1 23 50.1
1 23 60.1
```

HYDROGRAPH ROUTING

PULS RESERVOIR ROUTING

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
2	1	0	0	0	0	1

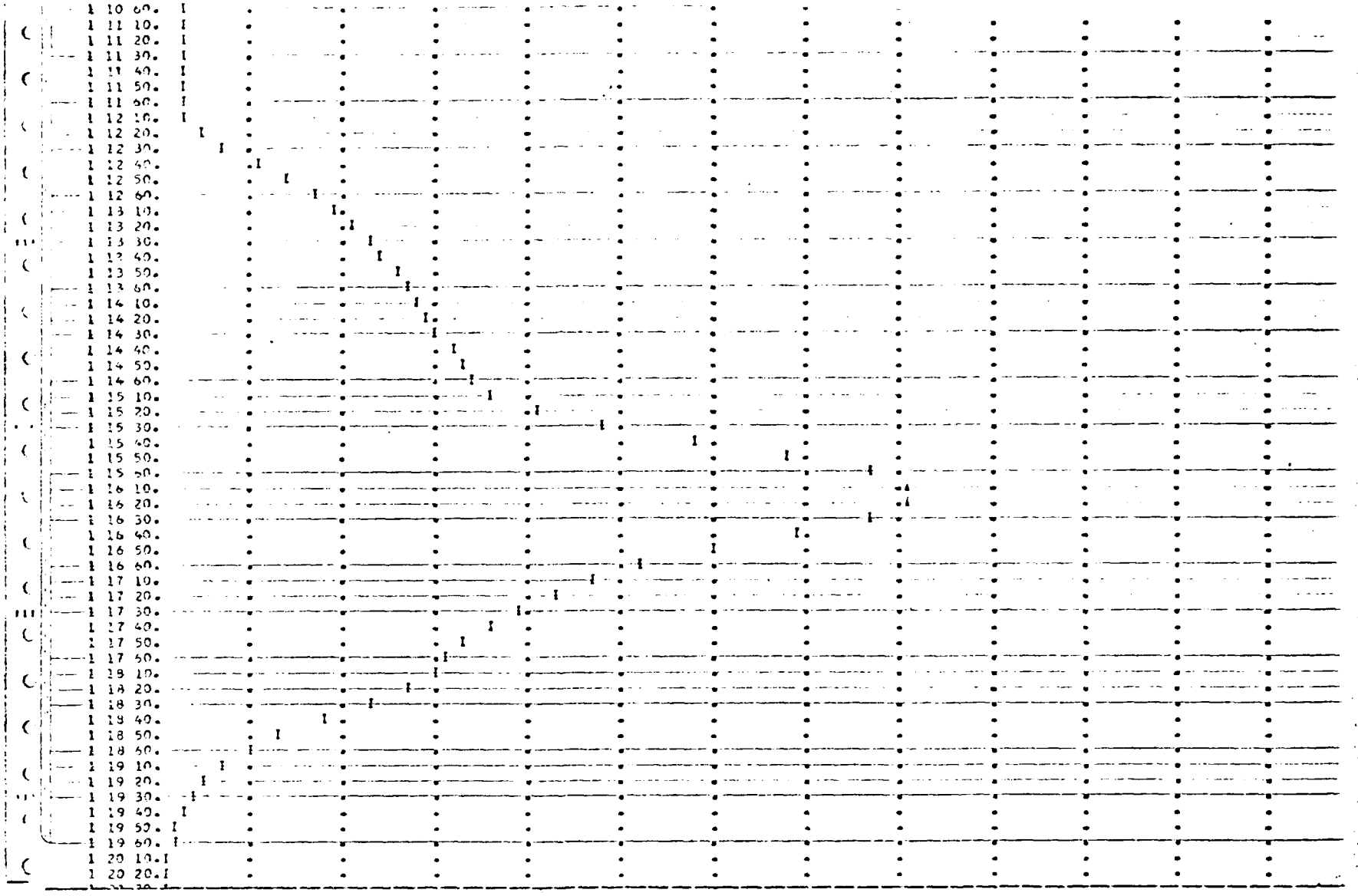
ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTOL	LAG	AMSKK	X	TSK	STORA
0	0	0	0.0	0.0	0.0	-1.

STORAGE=	850.	943.	956.	1009.	1062.	1089.	1115.	1168.	1221.	1274.
OUTFLOW=	0.	0.	10.	120.	265.	385.	565.	2105.	6850.	13735.

	TIME	EOP STOR	AVG IN	EOP OUT
1	0 10	943.	0.	0.
1	0 20	943.	0.	0.
1	0 30	943.	0.	0.
1	0 40	943.	0.	0.
1	0 50	943.	0.	0.
1	0 60	943.	0.	0.
1	1 10	943.	0.	0.
1	1 20	943.	0.	0.
1	1 30	943.	0.	0.
1	1 40	943.	0.	0.
1	1 50	943.	0.	0.
1	1 60	943.	0.	0.
1	2 10	943.	0.	0.
1	2 20	943.	0.	0.
1	2 30	943.	0.	0.
1	2 40	943.	0.	0.
1	2 50	943.	0.	0.
1	2 60	943.	0.	0.
1	3 10	943.	0.	0.
1	3 20	943.	0.	0.
1	3 30	943.	0.	0.
1	3 40	943.	0.	0.
1	3 50	943.	0.	0.
1	3 60	943.	0.	0.
1	4 10	943.	0.	0.
1	4 20	943.	0.	0.
1	4 30	943.	0.	0.
1	4 40	943.	0.	0.
1	4 50	943.	0.	0.
1	4 60	943.	0.	0.
1	5 10	943.	0.	0.
1	5 20	943.	0.	0.
1	5 30	943.	0.	0.
1	5 40	943.	0.	0.
1	5 50	943.	0.	0.
1	5 60	943.	0.	0.
2	6 10	943.	0.	0.
1	6 20	943.	1.	0.
1	6 30	943.	4.	0.
1	6 40	943.	8.	0.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1 13 60.
1 14 10.
1 14 20.
1 14 30.
1 14 40.
1 14 50.
1 14 60.
1 15 10.
1 15 20.
1 15 30.
1 15 40.
1 15 50.
1 15 60.
1 16 10.
1 16 20.
1 16 30.
1 16 40.
1 16 50.
1 16 60.
1 17 10.
1 17 20.
1 17 30.
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1 17 50.
1 17 60.
1 18 10.
1 18 20.
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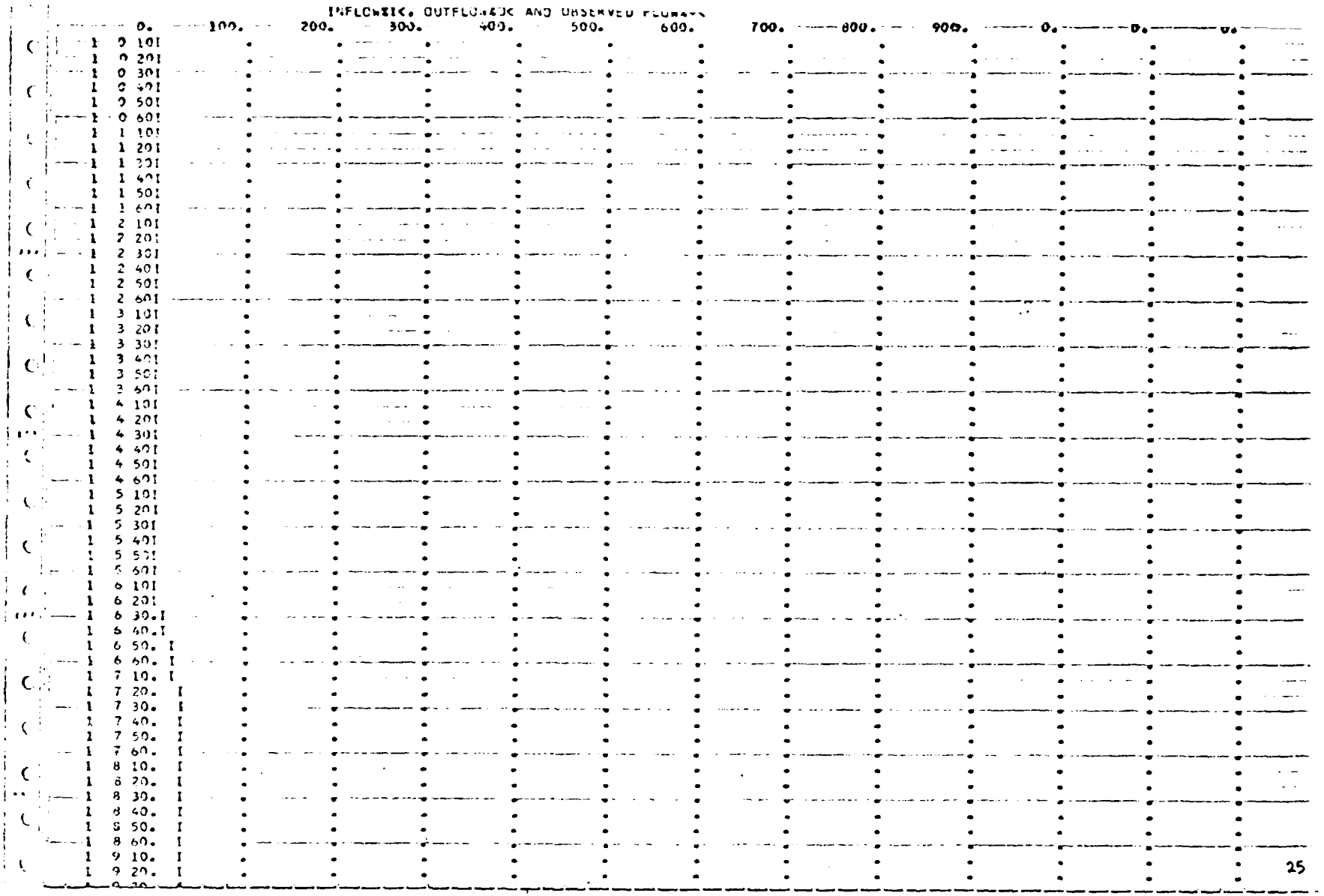
1 20 20.


INFLOW#I, OUTFLOW#J, AND OBSERVED FLOWS
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1 0 30I
1 0 40I
1 0 50I
1 0 60I
1 1 10I
1 1 20I
1 1 30I
1 1 40I
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1 2 60I
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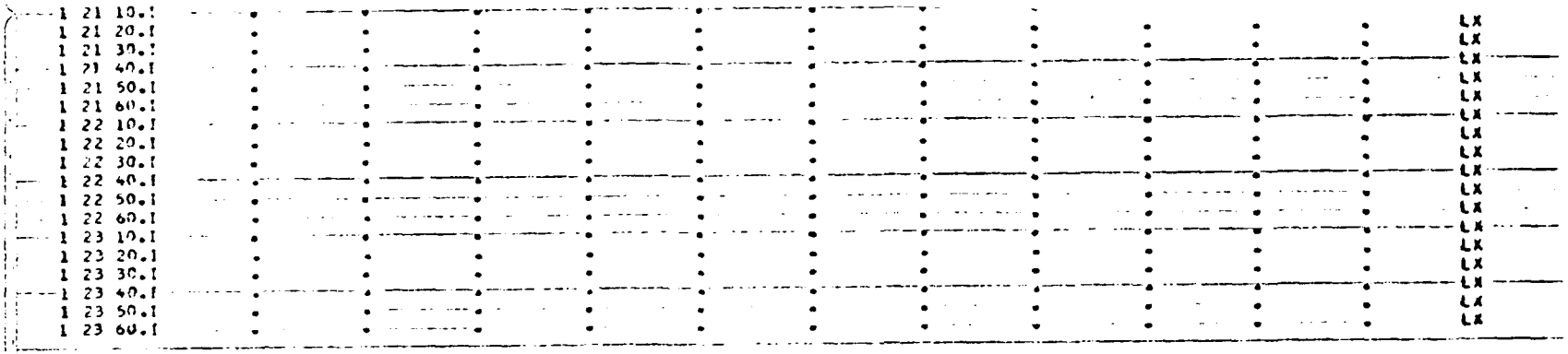
1 8 10. I
1 8 20. I
1 8 30. I
1 8 40. I
1 8 50. I
1 8 60. I
1 9 10. I
1 9 20. I

0.	0.	0.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	2.	4.	8.	12.
17.	21.	24.	28.	27.	28.	29.	30.	30.	30.
30.	30.	31.	31.	31.	31.	31.	31.	31.	31.
31.	31.	31.	31.	31.	31.	31.	31.	31.	31.
31.	31.	35.	48.	74.	109.	144.	173.	194.	212.
228.	244.	257.	268.	277.	287.	301.	316.	330.	342.
362.	407.	483.	502.	663.	766.	812.	812.	765.	685.
546.	522.	468.	420.	391.	360.	334.	314.	295.	267.
228.	181.	134.	95.	69.	50.	37.	28.	22.	17.
14.	12.	10.	9.	8.	8.	7.	7.	7.	7.
7.	7.	7.	7.	7.	7.	7.	7.	7.	7.
7.	7.	7.	7.						

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	812.	398.	113.	113.	16234.
INCHES		0.22	9.32	9.32	9.32
AC-FT		197.	224.	224.	224.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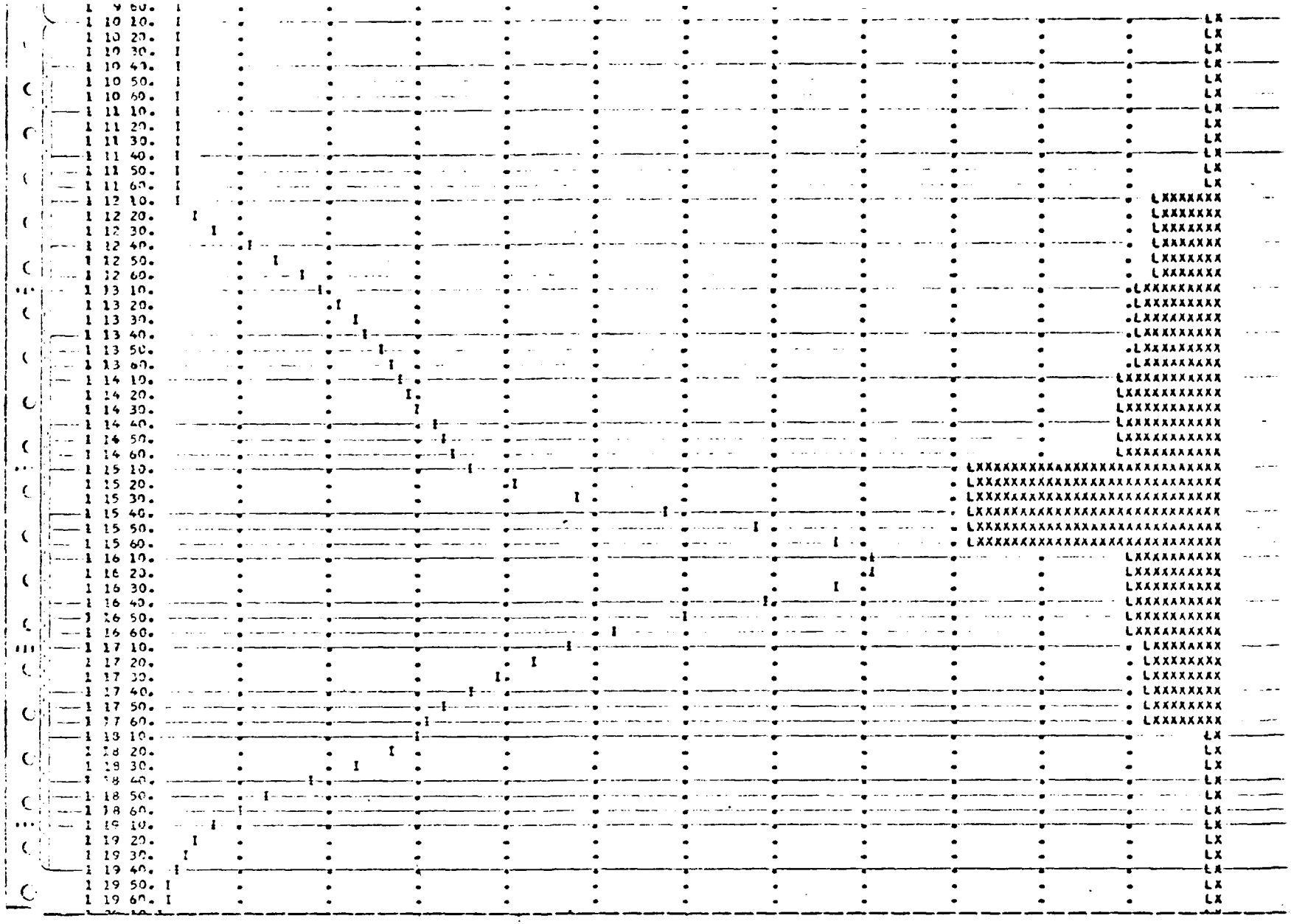
1 23 60.1



OVF

STATION 3

INFLOW**, OUTFLOW** AND OBSERVED FLOW**

	0.	200.	400.	600.	800.	1000.	1200.	1400.	1600.	1800.	0.	0.	0.
											PRECIP** AND EXCESS**		
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.8	0.4	0.0
1	0 10												L
1	0 20												L
1	0 30												L
1	0 40												L
1	0 50												L
1	0 60												L
1	1 10												L
1	1 20												L
1	1 30												L
1	1 40												L
1	1 50												L
1	1 60												L
1	2 10												L
1	2 20												L
1	2 30												L
1	2 40												L
1	2 50												L
1	2 60												L
1	3 10												L
1	3 20												L
1	3 30												L
1	3 40												L
1	3 50												L
1	3 60												L
1	4 10												L
1	4 20												L
1	4 30												L
1	4 40												L
1	4 50												L
1	4 60												L
1	5 10												L
1	5 20												L
1	5 30												L
1	5 40												L
1	5 50												L
1	5 60												L
1	6 10												LX
1	6 20												LX
1	6 30.	I											LX
1	6 40.	I											LX
1	6 50.	I											LX
1	6 60.	I											LX
1	7 10.	I											LX
1	7 20.	I											LX
1	7 30.	I											LX
1	7 40.	I											LX
1	7 50.	I											LX
1	7 60.	I											LX
1	8 10.	I											LX
1	8 20.	I											LX
1	8 30.	I											LX
1	8 40.	I											LX
1	8 50.	I											LX
1	8 60.	I											LX

1	15	50	1.12	1.11	1367.
1	15	60	1.12	1.11	1531.
1	16	10	0.41	0.40	1624.
1	16	20	0.41	0.40	1624.
1	16	30	0.41	0.40	1550.
1	16	40	0.41	0.40	1370.
1	16	50	0.41	0.40	1192.
1	16	60	0.41	0.40	1044.
1	17	10	0.33	0.31	937.
1	17	20	0.33	0.31	852.
1	17	30	0.33	0.31	781.
1	17	40	0.33	0.31	719.
1	17	50	0.33	0.31	667.
1	17	60	0.33	0.31	628.
1	18	10	0.03	0.01	590.
1	18	20	0.03	0.01	535.
1	18	30	0.03	0.01	456.
1	18	40	0.03	0.01	361.
1	18	50	0.03	0.01	267.
1	18	60	0.03	0.01	191.
1	19	10	0.03	0.01	137.
1	19	20	0.03	0.01	101.
1	19	30	0.03	0.01	75.
1	19	40	0.03	0.01	56.
1	19	50	0.03	0.01	43.
1	19	60	0.03	0.01	34.
1	20	10	0.03	0.01	28.
1	20	20	0.03	0.01	24.
1	20	30	0.03	0.01	21.
1	20	40	0.03	0.01	18.
1	20	50	0.03	0.01	17.
1	20	60	0.03	0.01	16.
1	21	10	0.03	0.01	15.
1	21	20	0.03	0.01	15.
1	21	30	0.03	0.01	15.
1	21	40	0.03	0.01	15.
1	21	50	0.03	0.01	15.
1	21	60	0.03	0.01	15.
1	22	10	0.03	0.01	15.
1	22	20	0.03	0.01	15.
1	22	30	0.03	0.01	15.
1	22	40	0.03	0.01	15.
1	22	50	0.03	0.01	15.
1	22	60	0.03	0.01	15.
1	23	10	0.03	0.01	15.
1	23	20	0.03	0.01	15.
1	23	30	0.03	0.01	15.
1	23	40	0.03	0.01	15.
1	23	50	0.03	0.01	15.
1	23	60	0.03	0.01	15.
		SUM	21.36	19.02	32469.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1624.	795.	225.	225.	32468.
INCHES		16.44	18.64	18.64	18.64
AC-FT		394.	447.	447.	447.

1	4	30	0.02	0.00	3.
1	4	40	0.02	0.00	3.
1	4	50	0.02	0.00	3.
1	4	60	0.02	0.00	3.
1	5	10	0.02	0.00	3.
1	5	20	0.02	0.00	3.
1	5	30	0.02	0.00	3.
1	5	40	0.02	0.00	3.
1	5	50	0.02	0.00	3.
1	5	60	0.02	0.00	3.
1	6	10	0.05	0.04	4.
1	6	20	0.05	0.04	8.
1	6	30	0.05	0.04	15.
1	6	40	0.05	0.04	25.
1	6	50	0.05	0.04	34.
1	6	60	0.05	0.04	42.
1	7	10	0.05	0.04	48.
1	7	20	0.05	0.04	52.
1	7	30	0.05	0.04	55.
1	7	40	0.05	0.04	57.
1	7	50	0.05	0.04	58.
1	7	60	0.05	0.04	59.
1	8	10	0.05	0.04	60.
1	8	20	0.05	0.04	60.
1	8	30	0.05	0.04	61.
1	8	40	0.05	0.04	61.
1	8	50	0.05	0.04	61.
1	8	60	0.05	0.04	61.
1	9	10	0.05	0.04	61.
1	9	20	0.05	0.04	61.
1	9	30	0.05	0.04	61.
1	9	40	0.05	0.04	61.
1	9	50	0.05	0.04	61.
1	9	60	0.05	0.04	61.
1	10	10	0.05	0.04	61.
1	10	20	0.05	0.04	61.
1	10	30	0.05	0.04	61.
1	10	40	0.05	0.04	61.
1	10	50	0.05	0.04	61.
1	10	60	0.05	0.04	61.
1	11	10	0.05	0.04	61.
1	11	20	0.05	0.04	61.
1	11	30	0.05	0.04	61.
1	11	40	0.05	0.04	61.
1	11	50	0.05	0.04	61.
1	11	60	0.05	0.04	61.
1	12	10	0.30	0.28	69.
1	12	20	0.30	0.28	97.
1	12	30	0.30	0.28	149.
1	12	40	0.30	0.28	217.
1	12	50	0.30	0.28	288.
1	12	60	0.30	0.28	346.
1	13	10	0.36	0.34	388.
1	13	20	0.36	0.34	424.
1	13	30	0.36	0.34	457.
1	13	40	0.36	0.34	488.
1	13	50	0.36	0.34	515.
1	13	60	0.36	0.34	536.
1	14	10	0.44	0.43	554.
1	14	20	0.44	0.43	575.
1	14	30	0.44	0.43	601.
1	14	40	0.44	0.43	631.
1	14	50	0.44	0.43	661.
1	14	60	0.44	0.43	685.
1	15	10	1.12	1.11	724.

OVN

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SUB-AREA RUNOFF COMPUTATION

PROBABLE MAXIMUM 24-HOUR PRECIPITATION (SOUTH RE

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
3	0	0	0	0	0	1

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	0.45	0.0	0.45	1.00	0.500	0	0	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.0	16.00	111.00	123.00	133.00	0.0	0.0	0.0

LOSS DATA

STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0.0	0.0	1.00	0.0	0.0	1.00	0.34	0.12	0.0	0.10

UNIT HYDROGRAPH DATA

TP# 0.67 CP#0.68 NTA# 0

RECESSION DATA

STRTQ# 0.0 QRCSN# 0.0 RTIOR# 1.00

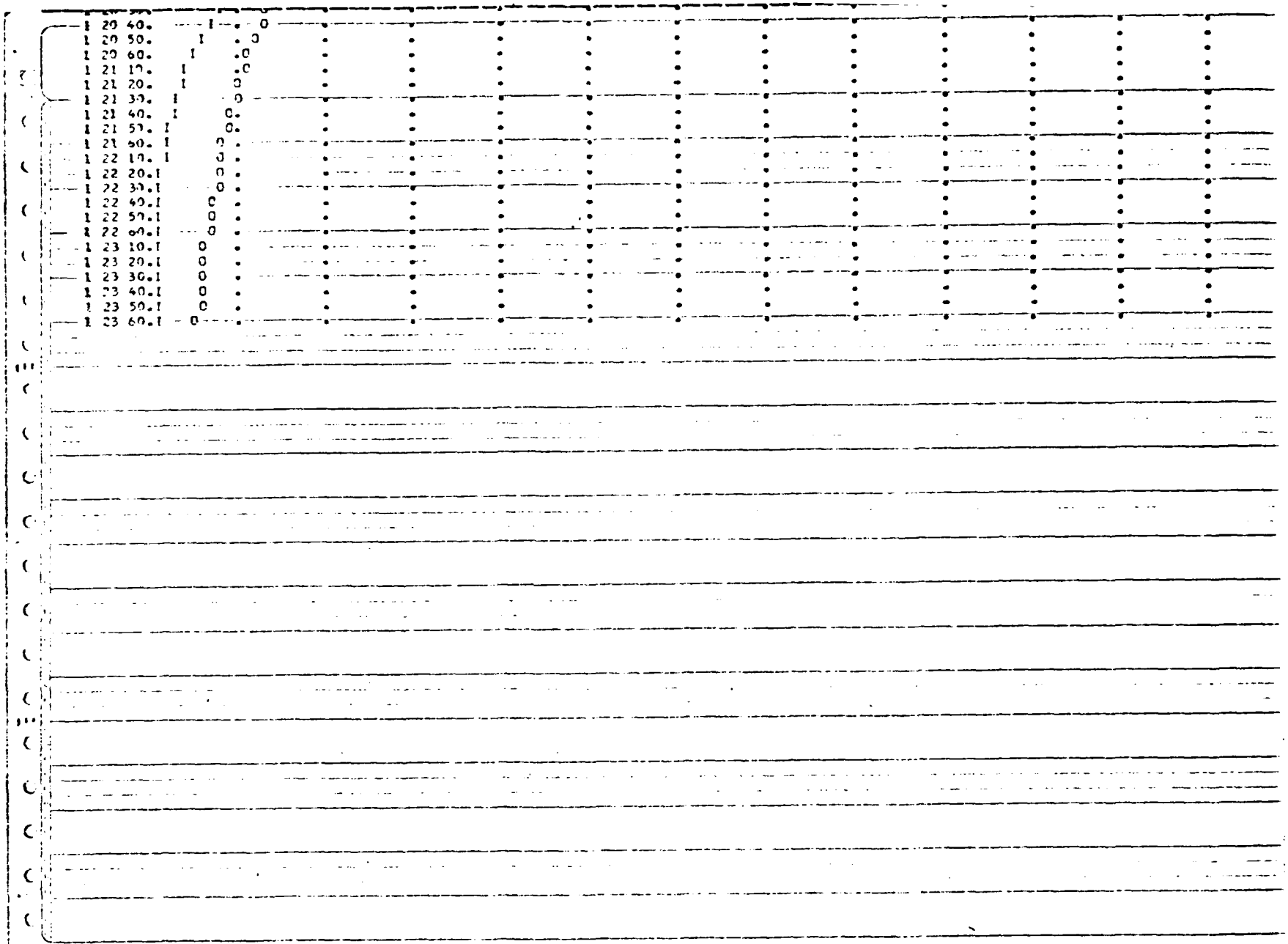
APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC# 4.59 AND R# 2.90 INTERVALS

UNIT HYDROGRAPH 19 END-OF-PERIOD ORDINATES, LAG# 0.67 HOURS, CP# 0.68 VOL# 1.00

32.	115.	213.	283.	291.	237.	166.	116.	83.	59.
42.	29.	21.	15.	10.	7.	5.	4.	3.	

END-OF-PERIOD FLOW

	TIME	RAIN	EXCS	COMP Q
1	0 10	0.02	0.00	0.
1	0 20	0.02	0.00	0.
1	0 30	0.02	0.00	1.
1	0 40	0.02	0.00	1.
1	0 50	0.02	0.00	2.
1	0 60	0.02	0.00	2.
1	1 10	0.02	0.00	2.
1	1 20	0.02	0.00	3.
1	1 30	0.02	0.00	3.
1	1 40	0.02	0.00	3.
1	1 50	0.02	0.00	3.
1	1 60	0.02	0.00	3.
1	2 10	0.02	0.00	3.
1	2 20	0.02	0.00	3.
1	2 30	0.02	0.00	3.
1	2 40	0.02	0.00	3.
1	2 50	0.02	0.00	3.
1	2 60	0.02	0.00	3.
1	3 10	0.02	0.00	3.
1	3 20	0.02	0.00	3.
1	3 30	0.02	0.00	3.
1	3 40	0.02	0.00	3.
1	3 50	0.02	0.00	3.
1	3 60	0.02	0.00	3.
1	4 10	0.02	0.00	3.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1 22 20.I 0
1 22 30.I 0
1 22 40.I 0
1 22 50.I 0
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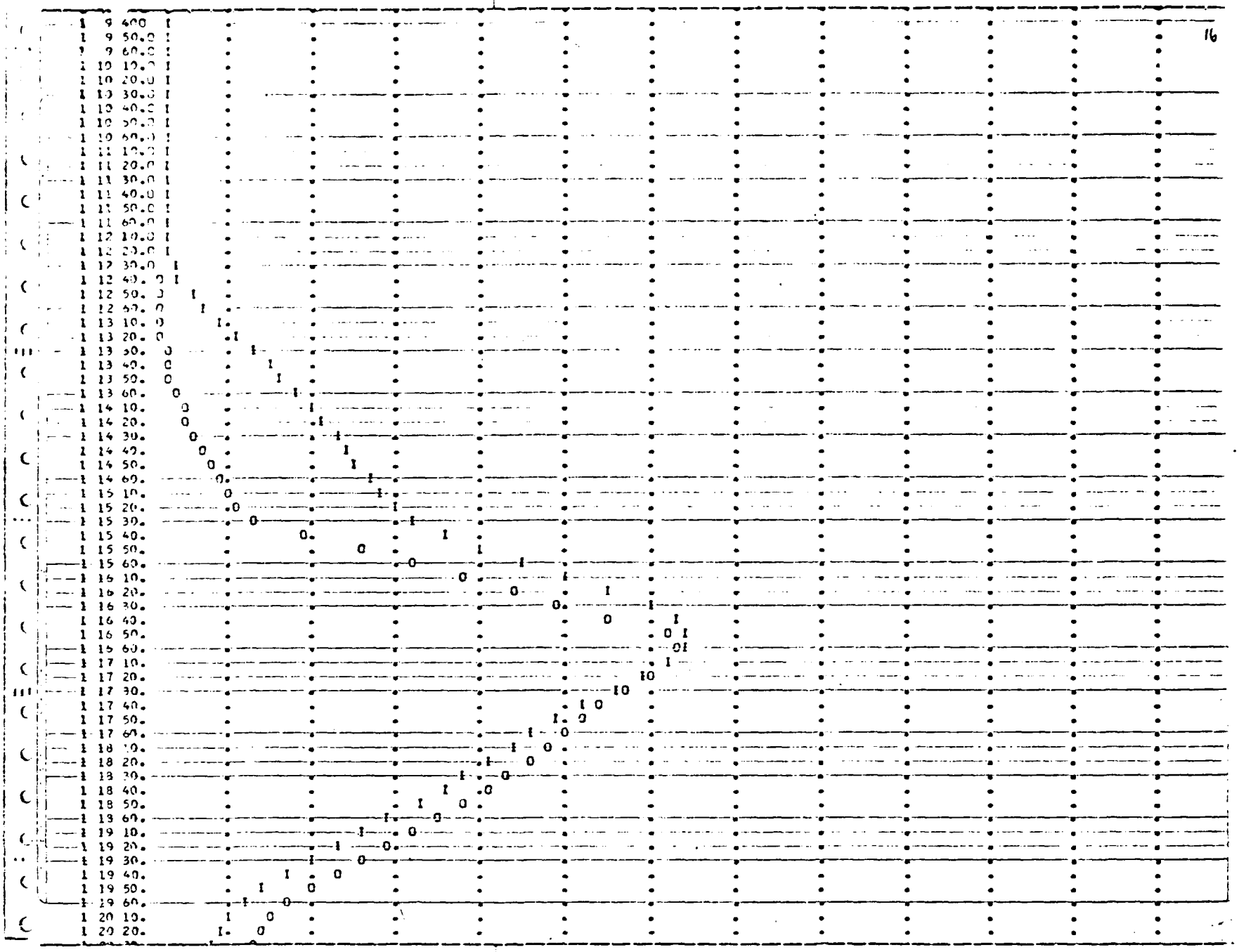
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1 19 30.0
1 19 40.0
1 19 50.0
1 19 60.0
1 20 10.0
1 20 20.0

OVF

STATION 2

INFLOW**, OUTFLOW*< AND OBSERVED FLOW*<

0. 400. 800. 1200. 1600. 2000. 2400. 2800. 0. 0. 0. 0. 0.

1 0 10I
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1 0 30I
1 0 40I
1 0 50I
1 0 60I
1 1 10I
1 1 20I
1 1 30I
1 1 40I
1 1 50I
1 1 60I
1 2 10I
1 2 20I
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1 5 40I
1 5 50I
1 5 60I
1 6 10I
1 6 20I
1 6 30I
1 6 40I
1 6 50I
1 6 600I
1 7 100I
1 7 200I
1 7 300I
1 7 400 I
1 7 500 I
1 7 600 I
1 8 100 I
1 8 200 I
1 8 300 I
1 8 400 I
1 8 500 I
1 8 600 I
1 9 100 I
1 9 200 I

1 17 60	1164.	1656.	1996.	
1 18 10	1161.	1791.	1914.	
1 18 20	1158.	1647.	1825.	
1 18 30	1155.	1539.	1730.	
1 18 40	1152.	1425.	1628.	
1 18 50	1148.	1305.	1520.	
1 18 60	1144.	1177.	1406.	
1 19 10	1140.	1046.	1286.	
1 19 20	1136.	915.	1162.	
1 19 30	1131.	789.	1036.	
1 19 40	1127.	675.	917.	
1 19 50	1123.	575.	805.	
1 19 60	1120.	491.	699.	
1 20 10	1116.	420.	606.	
1 20 20	1113.	359.	554.	
1 20 30	1110.	307.	531.	
1 20 40	1107.	263.	507.	
1 20 50	1103.	226.	481.	
1 20 60	1099.	194.	455.	
1 21 10	1095.	166.	429.	
1 21 20	1092.	145.	403.	
1 21 30	1088.	125.	381.	
1 21 40	1084.	107.	367.	
1 21 50	1081.	92.	354.	
1 21 60	1077.	79.	340.	
1 22 10	1073.	68.	326.	
1 22 20	1070.	59.	313.	
1 22 30	1066.	52.	300.	
1 22 40	1063.	46.	287.	
1 22 50	1059.	42.	277.	
1 22 60	1056.	38.	267.	
1 23 10	1053.	35.	257.	
1 23 20	1050.	32.	248.	
1 23 30	1047.	30.	238.	
1 23 40	1044.	29.	230.	
1 23 50	1041.	27.	221.	
1 23 60	1039.	26.	213.	
SUM			58046.	

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2526.	1372.	403.	403.	58046.
INCHES		6.97	8.20	8.20	8.20
AC-FT		680.	800.	800.	800.

1	6	60	944.	23.	1.
1	7	10	944.	32.	1.
1	7	20	945.	43.	1.
1	7	30	945.	53.	2.
1	7	40	946.	63.	2.
1	7	50	947.	71.	3.
1	7	60	948.	78.	4.
1	8	10	949.	84.	5.
1	8	20	950.	89.	6.
1	8	30	952.	94.	7.
1	8	40	953.	97.	8.
1	8	50	954.	100.	9.
1	8	60	955.	103.	10.
1	9	10	957.	105.	12.
1	9	20	958.	107.	14.
1	9	30	959.	109.	17.
1	9	40	961.	110.	20.
1	9	50	962.	111.	22.
1	9	60	963.	112.	25.
1	10	10	964.	113.	27.
1	10	20	965.	114.	30.
1	10	30	967.	115.	32.
1	10	40	968.	115.	34.
1	10	50	969.	116.	37.
1	10	60	970.	116.	39.
1	11	10	971.	116.	41.
1	11	20	972.	117.	43.
1	11	30	973.	117.	45.
1	11	40	974.	117.	47.
1	11	50	975.	117.	49.
1	11	60	976.	117.	51.
1	12	10	977.	119.	53.
1	12	20	978.	127.	55.
1	12	30	979.	146.	58.
1	12	40	981.	178.	61.
1	12	50	983.	224.	66.
1	12	60	986.	284.	72.
1	13	10	990.	353.	80.
1	13	20	994.	430.	90.
1	13	30	1000.	510.	101.
1	13	40	1007.	588.	115.
1	13	50	1014.	660.	136.
1	13	60	1022.	726.	160.
1	14	10	1030.	788.	187.
1	14	20	1039.	846.	214.
1	14	30	1049.	903.	243.
1	14	40	1058.	959.	273.
1	14	50	1068.	1014.	308.
1	14	60	1078.	1067.	346.
1	15	10	1089.	1125.	385.
1	15	20	1100.	1198.	458.
1	15	30	1111.	1298.	535.
1	15	40	1121.	1430.	703.
1	15	50	1131.	1596.	1034.
1	15	60	1140.	1793.	1287.
1	16	10	1148.	2008.	1528.
1	16	20	1156.	2217.	1757.
1	16	30	1163.	2391.	1969.
1	16	40	1169.	2510.	2207.
1	16	50	1172.	2561.	2477.
1	16	60	1173.	2544.	2528.
1	17	10	1172.	2474.	2487.
1	17	20	1171.	2366.	2395.
1	17	30	1170.	2235.	2273.
1	17	40	1168.	2100.	2141.

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1 23 30.1
1 23 40.1
1 23 50.1
1 23 60.1
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DVN

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COMBINE HYDROGRAPHS

COMBINED NORTH RESERVOIR OUTFLOW AND SOUTH RESERVOI

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
4	2	0	0	0	0	1

SUM OF 2 HYDROGRAPHS AT 4

0.	0.	0.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	2.	2.
1.	1.	1.	1.	1.	1.	2.	4.	8.	12.
17.	22.	25.	27.	29.	31.	32.	34.	35.	36.
37.	38.	39.	40.	42.	45.	48.	50.	53.	55.
58.	60.	63.	65.	67.	69.	72.	74.	76.	78.
80.	82.	88.	104.	132.	170.	210.	245.	274.	301.
330.	359.	393.	429.	464.	502.	544.	589.	639.	688.
746.	865.	1016.	1635.	1717.	2052.	2340.	2569.	2734.	2892.
3073.	3050.	2955.	2821.	2663.	2500.	2398.	2310.	2208.	2093.
1958.	1809.	1654.	1501.	1354.	1212.	1075.	945.	825.	716.
620.	565.	541.	516.	490.	463.	436.	411.	388.	375.
361.	347.	334.	321.	308.	295.	284.	274.	264.	255.
246.	237.	229.	223.						

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3073.	1695.	516.	516.	74279.
INCHES		6.92	8.42	8.42	8.42
AC-FT		841.	1024.	1024.	1024.

OVF

STATION 4

INFLOW=I<, OUTFLOW=O< AND OBSERVED FLOW=*<

0. 400. 800. 1200. 1600. 2000. 2400. 2800. 3200. 0. 0. 0. 0.

1 0 10I
1 0 20I
1 0 30I
1 0 40I
1 0 50I
1 0 60I
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1 1 60I
1 2 10I
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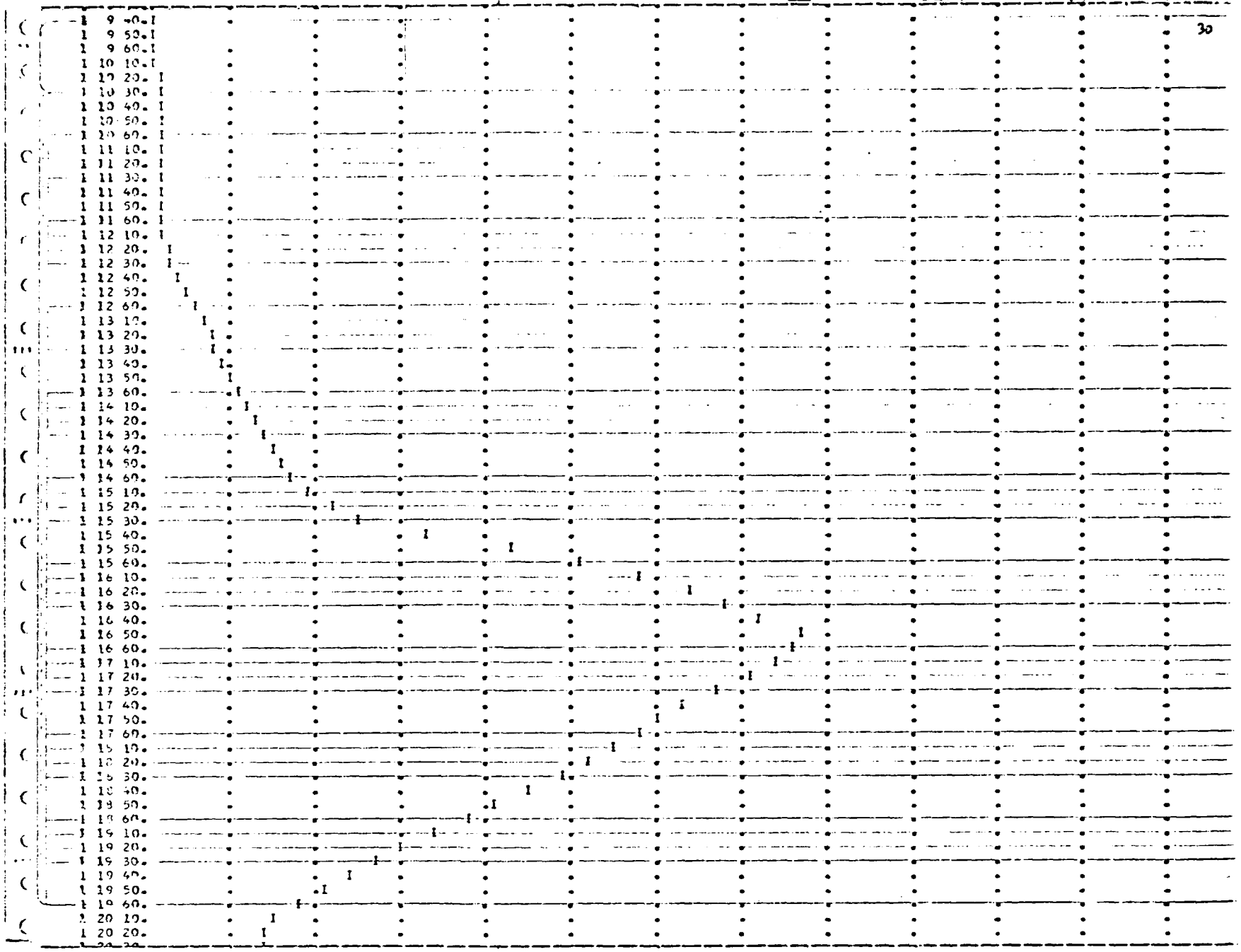
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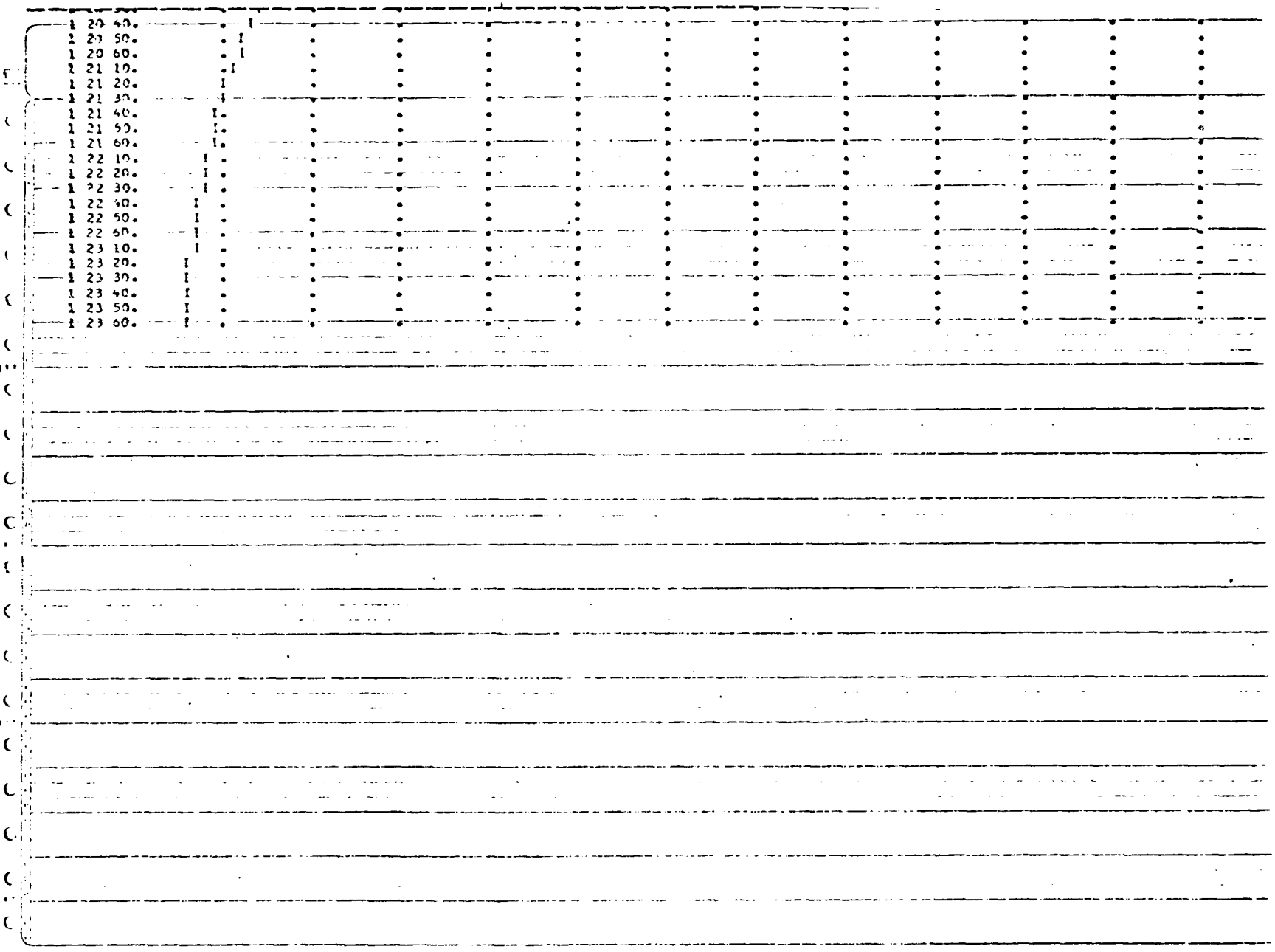
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1 22 50.
1 22 60.
1 23 10.
1 23 20.
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1 23 60.

OVN

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HYDROGRAPH ROUTING

PULS RESERVOIR ROUTING

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME
5	1	0	0	0	0	1

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME
0.0	0.0	0.0	1	0

NSTPS	NSTOL	LAG	AMSKK	X	TSK	STORA
0	0	0	0.0	0.0	0.0	-1.

STORAGE#	322.	417.	441.	458.	475.	492.	509.	526.	543.	560.
OUTFLOW#	0.	0.	55.	125.	210.	310.	765.	2390.	4790.	7745.

	TIME	EOP STOR	AVG IN	EOP OUT
1	0 10	417.	0.	0.
1	0 20	417.	0.	0.
1	0 30	417.	0.	0.
1	0 40	417.	0.	0.
1	0 50	417.	1.	0.
1	0 60	417.	1.	0.
1	1 10	417.	1.	0.
1	1 20	417.	1.	0.
1	1 30	417.	1.	0.
1	1 40	417.	1.	0.
1	1 50	417.	1.	0.
1	1 60	417.	1.	0.
1	2 10	417.	1.	0.
1	2 20	417.	1.	0.
1	2 30	417.	1.	0.
1	2 40	417.	1.	0.
1	2 50	417.	1.	0.
1	2 60	417.	1.	1.
1	3 10	417.	1.	1.
1	3 20	417.	1.	1.
1	3 30	417.	1.	1.
1	3 40	417.	1.	1.
1	3 50	417.	1.	1.
1	3 60	417.	1.	1.
1	4 10	417.	1.	1.
1	4 20	417.	1.	1.
1	4 30	417.	1.	1.
1	4 40	417.	1.	1.
1	4 50	417.	1.	1.
1	4 60	417.	1.	1.
1	5 10	417.	1.	1.
1	5 20	417.	1.	1.
1	5 30	417.	1.	1.
1	5 40	417.	1.	1.
1	5 50	417.	1.	1.
1	5 60	417.	1.	1.
1	6 10	417.	2.	1.
1	6 20	417.	3.	1.
1	6 30	418.	6.	1.
1	6 40	418.	10.	1.

1	7	20	419.	26.	--		
1	7	30	419.	28.	5.		
1	7	40	419.	30.	5.		
1	7	50	420.	32.	6.		
1	7	60	420.	33.	7.		
1	8	10	420.	34.	8.		
1	8	20	421.	35.	9.		
1	8	30	421.	36.	10.		
1	8	40	422.	37.	10.		
1	8	50	422.	39.	11.		
1	8	60	422.	40.	12.		
1	9	10	423.	41.	13.		
1	9	20	423.	44.	14.		
1	9	30	424.	46.	15.		
1	9	40	424.	49.	16.		
1	9	50	424.	51.	17.		
1	9	60	425.	54.	18.		
1	10	10	426.	57.	19.		
1	10	20	426.	59.	21.		
1	10	30	427.	61.	22.		
1	10	40	427.	64.	23.		
1	10	50	428.	66.	25.		
1	10	60	428.	68.	26.		
1	11	10	429.	71.	27.		
1	11	20	430.	73.	29.		
1	11	30	430.	75.	30.		
1	11	40	431.	77.	32.		
1	11	50	431.	79.	33.		
1	11	60	432.	81.	35.		
1	12	10	433.	85.	36.		
1	12	20	434.	96.	38.		
1	12	30	435.	118.	40.		
1	12	40	436.	151.	44.		
1	12	50	438.	190.	48.		
1	12	60	441.	227.	54.		
1	13	10	443.	259.	65.		
1	13	20	446.	288.	77.		
1	13	30	450.	316.	90.		
1	13	40	453.	344.	104.		
1	13	50	457.	376.	119.		
1	13	60	460.	411.	137.		
1	14	10	465.	446.	158.		
1	14	20	469.	483.	179.		
1	14	30	473.	523.	202.		
1	14	40	478.	567.	229.		
1	14	50	483.	614.	259.		
1	14	60	489.	663.	291.		
1	15	10	494.	717.	366.		
1	15	20	499.	806.	503.		
1	15	30	504.	941.	659.		
1	15	40	510.	1176.	871.		
1	15	50	516.	1526.	1391.		
1	15	60	520.	1885.	1783.		
1	16	10	523.	2196.	2111.		
1	16	20	526.	2454.	2364.		
1	16	30	528.	2652.	2546.		
1	16	40	529.	2813.	2810.		
1	16	50	530.	2982.	2960.		
1	16	60	531.	3061.	3060.		
1	17	10	530.	3003.	3004.		
1	17	20	530.	2886.	2890.		
1	17	30	529.	2742.	2744.		
1	17	40	527.	2582.	2584.		

1	18	30	523.	2025.	2057.
1	18	40	521.	1883.	1919.
1	18	50	520.	1731.	1770.
1	18	60	518.	1578.	1617.
1	19	10	516.	1428.	1467.
1	19	20	515.	1283.	1321.
1	19	30	513.	1144.	1180.
1	19	40	512.	1010.	1045.
1	19	50	511.	885.	918.
1	19	60	509.	770.	801.
1	20	10	508.	668.	736.
1	20	20	506.	593.	692.
1	20	30	505.	553.	644.
1	20	40	503.	529.	612.
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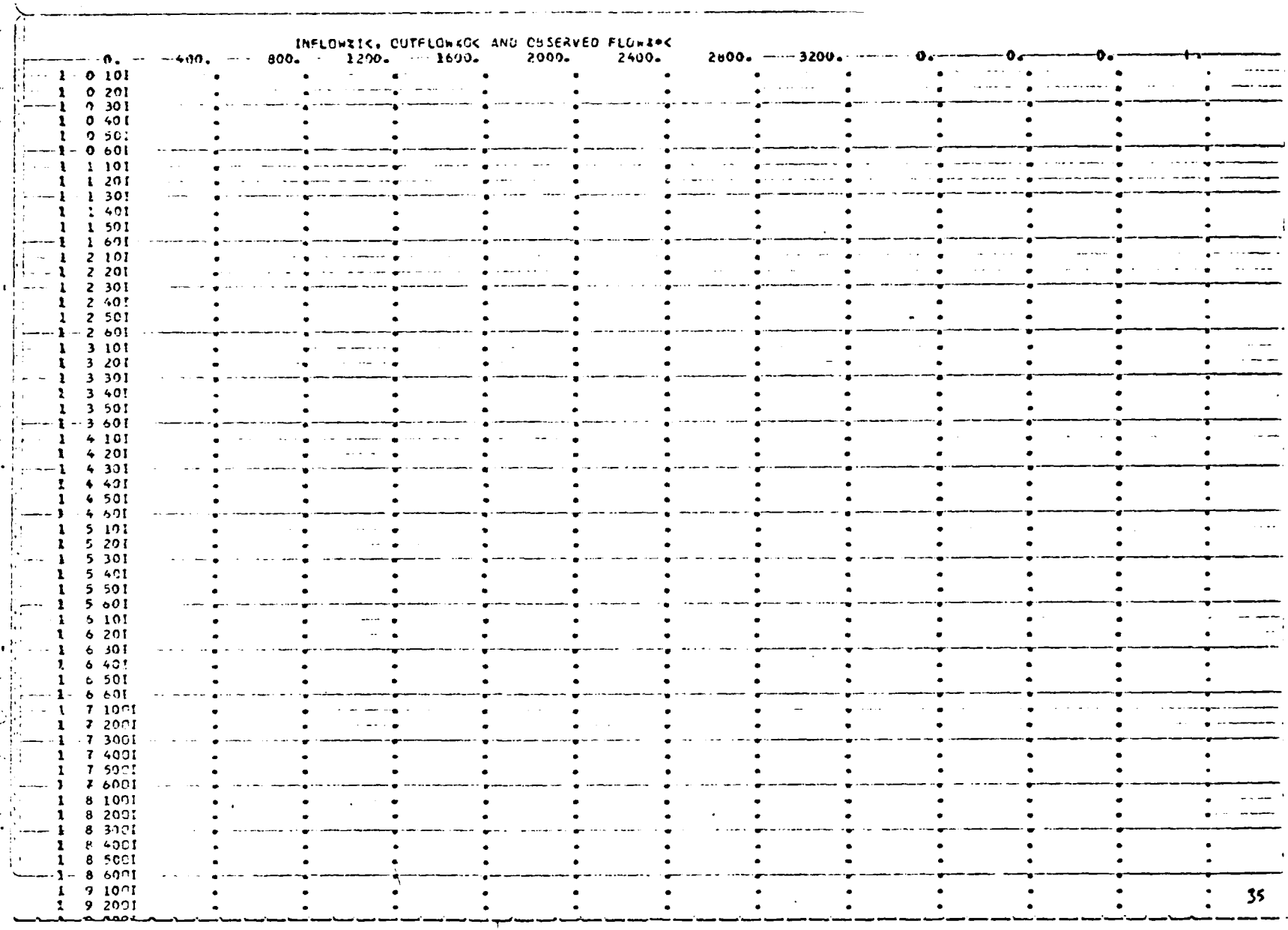
1	20	60	501.	476.	546.
1	21	10	500.	450.	516.
1	21	20	499.	423.	487.
1	21	30	498.	400.	460.
1	21	40	497.	382.	436.
1	21	50	496.	368.	415.
1	21	60	495.	354.	396.
1	22	10	495.	341.	379.
1	22	20	494.	327.	363.
1	22	30	493.	314.	348.
1	22	40	493.	301.	333.
1	22	50	492.	290.	320.
1	22	60	492.	279.	309.
1	23	10	491.	269.	306.
1	23	20	491.	260.	303.
1	23	30	490.	251.	298.
1	23	40	489.	242.	294.
1	23	50	488.	233.	289.
1	23	60	488.	225.	284.
		SUM			69185.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3060.	1669.	480.	480.	69185.
INCHES		6.81	7.84	7.84	7.84
AC-FT		828.	953.	953.	953.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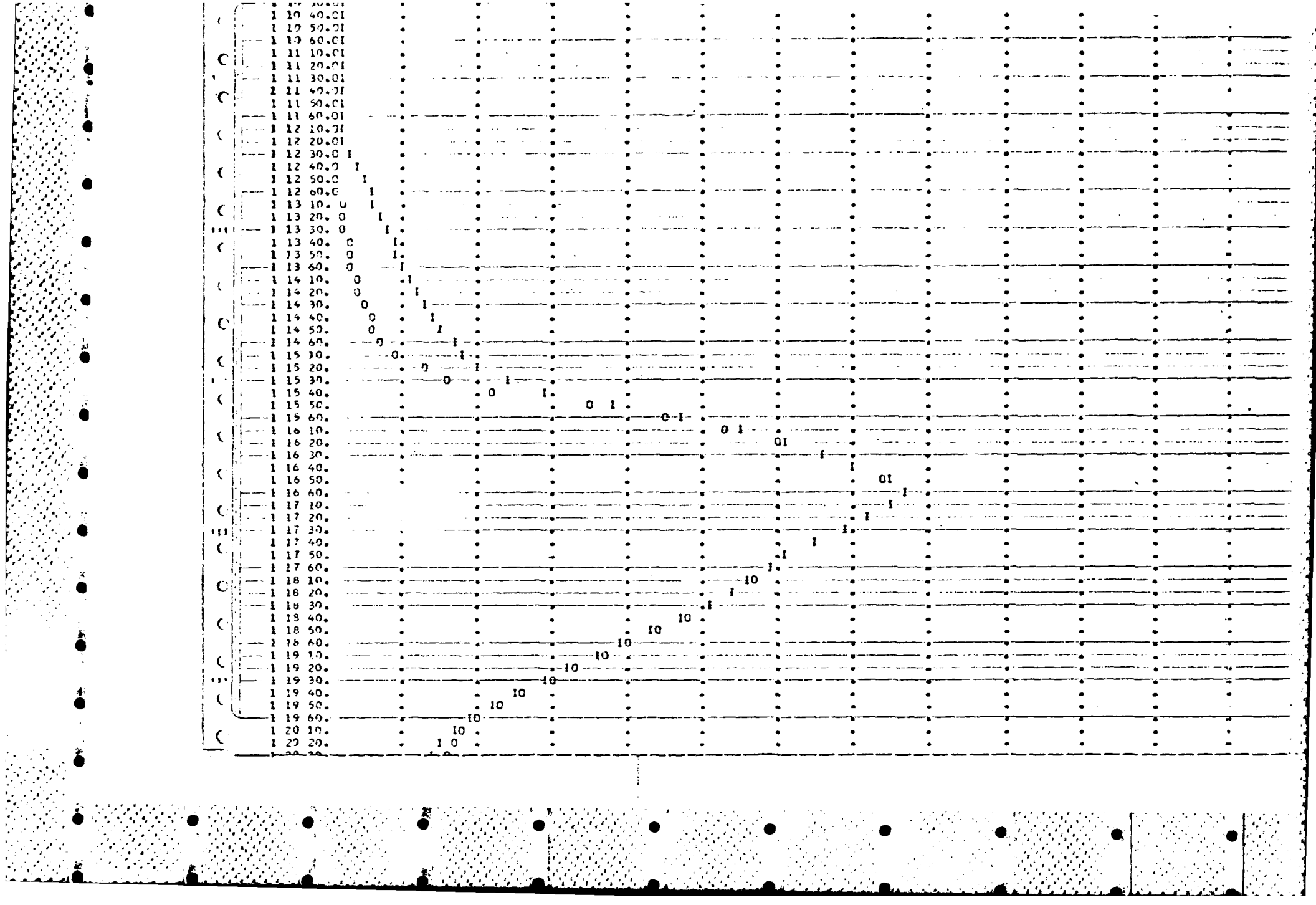

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1 23 20.      I 0 .
1 23 30.      10  .
1 23 40.      IC  .
1 23 50.      10  .
1 23 60.      IC  .
```

		PEAK	6-HOUR	24-HOUR	72-HOUR	
HYDROGRAPH AT	1	2566.	1525.	451.	451.	1.83
ROUTED TO	2	2528.	1372.	403.	403.	1.83
HYDROGRAPH AT	3	612.	398.	113.	113.	0.45
2 COMBINED	4	3073.	1695.	516.	516.	2.28
ROUTED TO	5	3060.	1669.	480.	480.	2.28

APPENDIX E

nformation as Contained in the National Inventory of Dams

POPULAR NAME	NAME OF IMPOUNDMENT
	SAINT ALBANS RESERVOIR (SOUTH)

REGION	BASIN	RIVER OR STREAM	NEAREST DOWNSTREAM CITY–TOWN–VILLAGE	DIST FROM DAM (MI.)	POPULATION
02	01	MILL RIVER	NORTH FAIRFAX	0	40

TYPE OF DAM	YEAR COMPLETED	PURPOSES	STRUC (TOTAL) HEIGHT (FT.)	HYDRAULIC HEIGHT (FT.)	IMPOUNDING CAPACITIES MAXIMUM (ACRE–FT.)	IMPOUNDING CAPACITIES NORMAL (ACRE–FT.)	DIST	OWN	FED R	PRV/FED	SCS A	VER/DATE
REPG	1910	S	20	12	530	322	NED	N	N	N	N	20CT78

REMARKS

SPILLWAY LENGTH (FT.)	SPILLWAY TYPE	SPILLWAY WIDTH (FT.)	MAXIMUM DISCHARGE (FT.)	VOLUME OF DAM (CY)	POWER CAPACITY INSTALLED (MW)	POWER CAPACITY PROPOSED (MW)	NAVIGATION LOCKS NO.	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)
2 1950	U	34	310	672760											

OWNER	ENGINEERING BY	CONSTRUCTION BY
CITY OF SAINT ALBANS		

REGULATORY AGENCY			
DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
WATER RESOURCES BD	WATER RESOURCES BD	WATER RESOURCES BD	WATER RESOURCES BD

INSPECTION BY	INSPECTION DATE DAY	MO	YR	AUTHORITY FOR INSPECTION
DUFRESNE-HENRY ENG CORP	02OCT78			PL-92-367

REMARKS